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NEWSPAPER

NEWS IN BRIEF

Justice Dept.'s Baker To Speak at FJCC

ANAHEIM, Calif. – The director of policy planning for the Justice Department's Antitrust Division, Donald Baker, will address a luncheon during the Fall Joint Computer Conference here.

Baker will speak during the banking seminar on Wednesday, in the Disneyland Hotel Convention Center, but the luncheon is priced separately ($5.50) from the seminar and from the rest of the program.

With all 410 booth spaces sold out at the Anaheim Convention Center, planners for the Fall Joint Computer Conference are gearing up for the three-day affair, Dec. 5-7.

Grants Beef Up Calif. City, County Crime Fighting Forces

SACRAMENTO, Calif. – The California Council on Criminal Justice (CCCJ) has awarded cities and counties some $5 million to fight crime, with 20% of the money going directly for computer projects.

In all, 55 separate projects were approved under the Omnibus Crime Control Act, CCCJ reported; legal arrangements between the council and the applicants must be finalized.

One of the largest grants was for continuation of the Los Angeles Automated Worthless Document Index. Some $336,000 was authorized for the city to continue work on the computerized system to store and retrieve data on such "worthless" items as bad checks.

The city and county of San Francisco will proceed with Phase III of its Computer Assisted Bay-area Law Enforcement (Cable) system, as a result of a $277,000 grant. Phase III will provide for a records-management module for the police information system.

The city of Glendale was authorized to spend $64,800 in a second-year grant for the Real-Time Data Capture project, a system to permit the acquisition of police called-for services in computer-readable form.

On the Inside This Week

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Computer Break

These girls are among 23 pupils at the Sydney Girls' High School in New South Wales, Australia, who design and assemble computers during classroom breaks. Kits provided by IBM (Australia) contain the necessary components to build a small digital computer, capable of additions and subtractions. The aim is to teach students fundamental computer logic and design.

User Wins Suit

Oral Promise Ruled Binding in Contract

By Edward J. Bride
Of the CW Staff

YORK, Pa. – The validity of thousands of "standard" contracts may be jeopardized as a result of a court decision which admitted "oral representations" where terminology in the basic contract was vague or ambiguous.

The jury ruled that a saleman's promises, even if made only orally, can be binding, at least where they are made in order to clarify vagueness or generalities in the contract.

In the breach-of-contract case, a user sued Burroughs Corp. because of problems in implementing accounting applications on a small system, and the jury agreed the oral promises obligated the vendor.

Observers said if the decision stands, users of small systems would be impacted by the possibility that all standard contracts might come into question.

Normally, small users do not spend the considerable time and legal expenses on contract drafting and negotiations that users of larger systems can afford.

Carl Beasley Ford Inc. was awarded $56,000 in the suit, and Burroughs was expected to appeal because of the possible effects the judgment could have on either standard contracts, sources said.

The suit was filed last year in U.S. District Court, Philadelphia; Judge Alfred L. Luongo handed down the decision last month, and Burroughs later filed a motion for a new trial on Nov. 6.

Software Not Specified

The contract, according to a DP consultant, was specific as to hardware, but not specific on software.

The user, Don Rothrauff, vice-president and general manager of the agency, also said the contract did discuss training for programming, but agreed it was not specific.

The Burroughs' salesman, on the other hand, did promise complete program development for the E4000, and in fact he reviewed the agency's books during the preinstallation period, as part of the program development, Rothrauff said.

All this occurred between June and December of 1969, and then the Bur-

(Continued on Page 2)

DOS Users Aided

IBM Unwraps IMS Subsets

By Don Leavitt
Of the CW Staff

WHITE PLAINS, N.Y. – IBM continues to support its 360 users with new software even though the company's primary focus is the 370. The company now has a package to provide data-base capabilities for conventional DOS 360 or 370 installations, and expects to have another, for DOS/VS installations, by the fourth quarter of 1973.

The packages, Vancouver Data Language-One and Data Language/I-DOS/VS, are not the first data-base managers DOS users have available to them. Several independent software houses have catered to this area.

Compatible Subsets

The Data Language programs are compatible subsets of IBM's OS-based Information Management System (IMS), apparently not including the capabilities of the Data Management Language (DML) and the ability to control multifile, multimedia data bases.

Any of the data-base management systems relieve the programmer of the detailed coding needed to access his files and allow him to concentrate on the application logic of his program.

As with IMS, the new products allow the user to write in a choice of higher-level languages. There is no self-contained problem-solving language, as there is in data-base management systems from some independent software houses.

The new products form interfaces between the data-base and the programmer. Changes in the data-base structure are completely transparent to the application. New categories can be added to records; record sizes can be altered; and the data can be shifted from disk to tape, or tape to disk – without any reprogramming.

User Freedom

The new programs are compatible with each other as well as with IMS so users can move from one operating environment to another without disturbing their application programs. With its utilization of virtual storage, Data Language/I-DOS/VS is expected to handle more complex applications than the other product.

Vancouver Data Language-One will run under DOS on either a 360 or 370 mainframe with a main storage partition of 14K bytes. It is available now under license agreement for $350/mo, and carries Class B support classification.

Data Language/I-DOS/VS functions only under DOS/VS and therefore is limited to 370 equipment. It will be available late next year under license for $300/mo, and will be a Class A product.

Burroughs Intelligent Terminals Add Flexibility to Network Use

By Michael Weinstein
Of the CW Staff

DETROIT – Burroughs has strengthened its commitment to communications users at remote operating sites by adding five new intelligent terminals to its line.

The Burroughs TC 3500 Series announced last week is designed to let the user take advantage of a networked system, the firm said, by having the remotely located terminals perform a large portion of the processing tasks offline and send only completed results over the network to a centrally located computer.

This technique is said to free the computer from monitoring functions of remote-entry stations until there is a large amount of processing needed. User costs are also cut by reducing the amount of telephone connect charges, according to the firm.

With the TC 3500s the user may select the method of recording and communicating data. For example, a user can use the TC 3500 to record data off-line onto tape cassettes and transmit the collected data at the end of the day when the central computer is not busy.

The user can also transmit data between TC 3500 units or to input and display systems. In this case, the TC 3500 acts as a mini-network controller, servicing and handling information from other terminals. At the TC 3500 this information can be edited and transmitted to the central system. Again the advantage is that all work is done off-line.

Optionally, the intelligent terminal can be connected to other peripheral devices including a computer-compatible tape unit. One terminal thus can collect data from eight other intelligent terminals.

Users can attach line printers – operating at 90 and 180 line/min; paper tape and sorting devices; 80-column card equipment; a display terminal for visually checking transmitted data; and a magnetic record handler and magnetic record reader.

The TC 3500 incorporates MOS integrated circuitry for both logic and mem-

(Continued on Page 4)

What Was Expected of User, Vendor?

'Clearer Understanding' Sought With 2d Vendor as DP Sits Idle

By Molly Upton
DI tne CW Staff

SHREVEPORT, La. – This city has learned the hard way that there is more to computerization than just installing a computer and going "full steam ahead."

Because of a "breakdown in communications" both between the city and the vendor, and between city departments, a Honeywell Series 200 sat idle for about 11 months, after operating on a partial basis for nine months previous to the shutdown.

Now the city has turned to another vendor, IBM, and established a "clear understanding" as to what it expects from IBM and the forthcoming System/3, according to Finance Commissioner George Burton. The city has also set up a DP department as a separate entity, and defined the legal responsibility of that department's management and operations through an ordinance.

Part of the problem was that it was "not really clear what was expected" from Honeywell, according to Burton, who came into office about the time the 200 was shut down. The computer was then under the control of the Utilities Department, which "was not set up to manage it," he added.

Now the lines of responsibility have been clarified, he said, and the department will be under his jurisdiction. "Everyone thought that someone else was assuming the responsibility," he added.

Also, within the city departments themselves there was "a natural resistance to change," he observed.

A Honeywell spokesman said the city "kept changing the specs," and that the firm had put in two-and-a-half man years in about 11 months.

When the city was using the Honeywell machine, the payroll package was perfected, but only part of the utility billing workload was put on the system, Burton said. Without these two jobs running, the city couldn't justify the cost of the system, he added. An agreement was reached with Honeywell on termination of the lease.

Under the new contract, the city has defined more clearly what it needs in the way of technical assistance, Burton said.

Using a System/3 at an IBM center in anticipation of a January delivery, the city is running tests for the utility packages and conversion procedures for the payroll package.

The city hopes to add budgetary accounting, parking ticket control and cost accounting to the system once the primary functions are operative. The city payroll has been done out of house since the Honeywell machine was shut down last December.

User Sues His Two Suppliers

By a CW Staff Writer

AKRON, Ohio – A user is suing two companies – his hardware and software suppliers – for alleged shortcomings in the installation and use of a small system.

The defendants are Singer Corp., manufacturer of the System Ten, and Systemation Inc., a software and consulting company that recommended the System Ten to the plaintiff, International Chemical Workers Union (ICWU).

The suit seeks some $800,000 in alleged actual and punitive damages, but only three injuries are mentioned in the lawsuit, filed last month in the Summit County Court of Common Pleas.

The suit claimed the system "completely failed the needs" of the union because it allegedly had not performed "according to the allegations and promises made by representatives of either defendant."

It also claimed Systemation was trying to assert its continued employment by recommending Singer equipment, "resulting in material expenditures" by the union, and that in doing so, Systemation allegedly "willfully misled plaintiff."

The other action charged was alleged negligence on the part of Systemation. This alleged negligence, according to the union, came in the performance of services and "as approximate cause of said negligence plaintiff has suffered damages in the amount of $328,370.32."

Singer said it learned of the suit in the newspaper, and said the suit had "no basis in fact."

A company official also said he could document the performance of the machine, adding ICWU officials had sent complimentary letters to the company.

While development of a membership program was reported behind schedule, Singer said both defendants were surprised at the suit, particularly the allegations of negligent services. "Our service reports contradict their claims," according to Martin Moran, head of the Cleveland branch.

T/S Service a Willing Listener

WASHINGTON, D.C. – Three out of four complaints received by the Office of Consumer Affairs (OCA) are being answered by a time-shared, personalized letter-writing service.

The balance of the complaints requires individual attention by correspondence analysts or, in more complex cases, by senior OCA staff members. In either case, the statistical substance of the complaint and of the reply is added to a data base for later study, OCA acting administrative officer Frank R. Martin said recently.

By using the time-shared service – Leasco Response's Incommand System – OCA feels it has been able to answer the complaints more quickly, more consistently and at less expense than it could under normal, manual systems, Marvin indicated.

Much of the correspondence isn't even really complaints, but is seeking information and this obviously can be supplied by what are essentially form letters, he added.

When a letter or phone call is received, it is logged onto the data base through a Selectric-based terminal in the OCA facilities, with a code to indicate which of 125 standardized letters would be appropriate. The coding includes an indication of whether the correspondence is a new complaint or part of a continuing problem.

By updating the status of each piece of mail generated through the system, as replies are received from government agencies, trade associations or individual companies, the system allows OCA staff members to retrieve the current status of any given complaint, on command.

The system also tallies the complaints by type so OCA management may be able to identify trends and take corrective action before situations get out of control, Martin noted.

The computer is just a tool, he stressed, being used by OCA to help the consumer, and not to throw up a screen between the agency and the complaint.

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Some Time Off for the Judge?

UPPER MARLBORO, Md. – "Here come da judge" – and juror, too.

Prince George's County uses a computer system to select residents for jury duty, and when superior court Judge James Taylor requested a list of candidates from the computer, he found himself listed as a second alternate for grand Jury duty.

County officials say he probably won't serve but the judge said he "would have been delighted to do it. I've always wanted to see what happens in that grand jury room."

'Oral Representations' Held Binding in User's Contract Suit

(Continued from Page 1)

roughs salesman left the company just a few weeks short of the installation deadline of Jan. 2, 1970.

As the "delivery" deadline grew nearer, Rothrauff related, Burroughs went to a nearby Cadillac agency that also used an E4000. The vendor attempted to adopt the General Motors accounting system to the Ford agency, he said.

"There's no way that could work," Rothrauff continued, adding Burroughs representatives tried to run the programs on his system without testing or debugging them.

Damages Defined

The $56,000 in damages represented the purchase price of $35,000 – including the software – plus additional accounting fees incurred by the user, plus some outside DP time, Rothrauff said.

For some reason, he said, the jury applied a $9,000 credit for his year's use of the system, despite the fact that it never worked for him as intended; he originally sought a total of $65,000.

"I still don't have a set of books that makes any sense for 1970," he claimed. While the payroll portion of the system works acceptably, the intent was to put all accounting, including general ledger, on the system, he related.

According to court papers, the Ford agency relied on the vendor's "promise and advice" that installation would be completed on time, and discontinued its then-current accounting procedures without a parallel run.

In deciding against Burroughs, the jury answered several questions in favor of the user, posed by the defendant.

Included in the list of questions was whether an agreement on programming support had been reached (yes), whether the programming was delivered within a reasonable time (no), whether the user expressed his dissatisfaction within a reasonable time (yes), and whether, by paying its bills, the agency legally "accepted" the system (no).

Other Evidence

An attorney who specializes in computer contracts warned that when agreements do not fully describe the transactions they are intended to represent then other evidence is used in contract disputes.

With contracts that are specially-written and negotiated, the "fairly traditional" evidence includes oral representations by vendor representatives, he noted.

If there was any uncertainty on the applicability of this principle to standard contracts for small systems, this Philadelphia decision should remove it, other sources said.

Generalities such as "system," or even "hardware" and "software" do not describe adequately the elements of a legal agreement, the legal source said.

'One Case'

Burroughs said the decision was on "one specific case," and doubted it would impact all standard contracts.

The appeal was based on about 30 points, mostly of a technical, legal nature dealing with errors which the vendor believes were made by either the court or the jury (such as the verdict being "against the weight of the evidence" or errors in permitting certain testimony to be entered into evidence).

Burroughs lawyers said the decision should have "no bearing on standard contracts," emphasizing the suit was based on the performance of the computer, and not on promises of the salesman.

C of C Bowlers Team Up With 'Right' Team — Everyone's Happy

TOLEDO, Ohio – The impersonal judgment of a computer is responsible for assigning members of the local Chamber of Commerce League to bowling teams.

At the beginning of the season the names and bowling averages of 140 regular members were sorted by computer into 28 evenly matched teams, explained league secretary Bob Birkeland. In previous years, the secretary had handled the makeup of teams, based on the previous season's final averages.

Best Friends

But this was difficult because a number of bowlers expressed preferences regarding teammates, noted Vincent Schlacter, a member of the board of governors who thought of giving the task to a computer.

"This had a natural tendency to put undue pressure on the secretary in arranging the personnel for 28 teams. The computer is as impartial as a traffic light when it comes to names. Its primary function is to handle and assess the figures or averages to equalize the teams," he added.

After eight weeks of bowling, there have been surprisingly few complaints, he noted.

Follow Traditional Security Methods, Canadian Says

By a CW Staff Writer

VICTORIA, B.C., Canada – "Traditional security precautions, in terms of personnel selection, for example, are at least as important as sophisticated systems of locks and passwords" in protecting privacy, Robert Stanbury, Canadian Minister of Communications, said here recently.

Stanbury, taking a look at some of the conclusions of a Canadian task force studying the issue of privacy in computer-based data banks, said the study "represents an attempt to describe, analyze and evaluate a social issue before that social issue has degenerated into a crisis.

"The privacy issue, although it is attracting increasing attention and concern, is not yet a crisis, nor is it out of control," he added.

But, he warned, "it could spring out of control unless we recognize and come to terms with what we are doing in building ever more efficient information systems – computerized or not – which store more and more personal information about individuals, often without the knowledge of the individuals concerned, and then use that information for purposes of which the individual may be unaware and over which he has little or no control."

Noting that to study the issue, the task force questioned over 2,500 operators of data banks of some sort, Stanbury reported "personal information systems appear to contain more errors than are generally recognized and that most institutions store their most sensitive information in manual rather than automated systems, though this is changing."

He noted, however, that the task force found a trend toward centralization of data storage, "and therefore to centralize decision making, with a concurrent and contrary trend toward dispersal of access to the data base through remote terminals."

There is one clear fact that stands out in any study of privacy, Stanbury contended.

"It is institutions which collect data; it is individuals about whom the data is collected. And between these parties there is a clear imbalance," he postulated.

"Institutions decide what data they need, and the purposes for which it is needed. Individuals often don't know that data about them has been collected; they do not know it is in their files; they do not know who has the right to see the data nor the purposes to which it is put," he stated.

"The question of a right of access by individuals to information held about them opens up a broader issue," Stanbury continued.

"The fact is that much of the debate about privacy and computers has less to do with privacy as we commonly understand that term than it has with power – with a balance of power, that is, between individuals and institutions.

"And in this context, ironically, it is individuals who are challenging the privacy of institutions. The debate is rooted in the oft-observed relationship between information and power. Those with information can make decisions that influence the lives of others without access to that information, who lack the means to, in effect, argue back," he said.

It is also important to note, Stanbury said, that generally computer-based data bases are used by the institutions in power and tend to deny access to those less powerful.

Fine Payers Find All's Not Fine

By Molly Upton
Of the CW Staff

BRIDGEPORT, Conn. – Use of the city's computer to collect parking fines has contributed a "substantial" amount of revenue to the city's coffers, and also helped reduce illegal parking within the city, but recently a "human error" in the control section of the computer room caused the police department to wonder about its accomplice in fine collecting.

Out of a monthly run of 4,000 notices sent to persons for parking fines, about 400 persons who had paid their fines also received notices.

A clerk apparently had thought a tape of persons who had paid fines had been checked against the master file of notices about to be sent out, when in fact the tape had not been run. The clerk had checked the totals against the edit list, rather than against the list that came from an actual posting run, so it was not shown that one tape had not been processed against the master file, DP manager Jack Delany explained.

"What is ironic," he said, "is that the clerk spent three hours spot checking bills before they were sent out. We had an error rate of 10%, but nothing showed up in the spot check," he remarked.

As soon as recipients started complaining, and the center realized the error, it ran off copies of the tape listing the persons who had paid their fines and distributed these to the police department and various city agencies. Clerks could then verify telephone queries on the status of a caller's payments.

"It was painful for the police for a couple of days," Delaney said, "but there were no real hassles." Apparently no one paid the fine twice, so there was no problem of rebates.

360/50s Replace 145, Put Firm 'Ahead of Game'

By E. Drake Lundell Jr.
Of the CW Staff

CHICAGO – The Golden 50 Pharmaceutical Co. here has replaced an IBM 370/145 and is currently running two leased 360/50s for about the same price.

On a price/performance basis, "we're ahead of the game," Joe Lavin, director of DP, said in discussing the move.

At the same time, however, Lavin pointed out the DP operation at Golden 50 was primarily a batch shop and the savings available to it might not be available to firms with a more communications-oriented operation.

Before the move, Golden 50 was operating one leased 360/50 and a 370/145 rented directly from IBM. All of the peripherals in the system are IBM manufactured, although the ones with the leased 50 were leased rather than rented directly from IBM.

The cost for the 262K 145 configuration alone was averaging around $18,000/mo, Lavin said. In addition, the firm was paying for the leased 360/50.

Last month, the firm "threw out" the 145 in favor of another leased 360/50 and now the total cost for the two leased 50s (both of which are leased through Itel) is just under $20,000/mo, Lavin said.

Spotlight on User's Lib

Faster But . . .

Lavin admitted the 370/145 was a better performer – "definitely faster" – than any single 50, but said that on a price/performance basis the single 145 would not touch the performance of two 360/50s for approximately the same monthly rental.

Under the new arrangement, the firm has a 512K 50 and a 262K 50 and all of the peripherals are manufactured by IBM, although leased through the third-party leasing firm.

"Since we operate in a batch mode," Lavin said, "we are not losing a lot" with the 262K 50 as compared to the performance of the 262K 145 it replaced.

The leasing arrangement also cuts down a lot of overtime charges, Lavin said. "We were running about 300 hr/mo overtime on the 145," he said, noting the leasing arrangement allows the firm to run all the overtime it wants each month without an additional charge, contrary to the IBM practice of charging for any use over 176 hours.

"Considering the amount of money we are saving," he concluded, "I would recommend the arrangement to any user with similar requirements."

Terminals Lift Network Users

(Continued from Page 1)

ory. The semiconductor memory has a total capacity of 64K bytes of both microprogrammed and user memory.

The minimum system configuration comes with 16K bytes.

System design uses variable micrologic to claim a cycle time of 3 msec and a memory read or write access time of 1.5 msec.

Internally the system uses a 32-character keyboard buffer and a 32-character print buffer, Burroughs said, that permits information to be keyed independent of the system's internal operation; the system allows printing functions to occur independently of keyboard and processor functions.

This capability will allow the system to be more effective as printing operations, local processing and communications overlap to provide greater system throughput, the firm added.

TC 3500 Software

Cobol is the standard programming language for the series. A library of systems software, application programs and diagnostic tools is also included.

The five models within the 3500 Series offer users a choice of forms handlers – 15-1/2 in. wide or 26 in. wide to accommodate several front-inserted and/or rear-inserted forms, unit set forms, cut or continuous roll journals, single- or dual-

A typical configuration of the TC 3500 Series could include the basic system, two cassette tape stations and a line printer.

pin feed forms and magnetic memory records.

Delivery Dates

Deliveries of the TC 3520, TC 3530 and TC 3540 models are scheduled for the first quarter of 1973. Deliveries of the TC 3570 and TC 3580 magnetic memory record models will begin in the second quarter.

Sale prices for the basic three smaller units range from $12,900 to $16,700 with comparable lease prices ranging from $350/mo to $450/mo.

Cost of magnetic memory record models ranges from $22,000 to $25,000 with monthly leases from $600/mo to $690/mo.

Prices for sale or lease of peripherals, I/O subsystems and memory size options are additional.

Bogus Credit Calls Checked

ST. LOUIS – Southwestern Bell has installed a new computer system to help detect fraudulent use of credit cards.

When someone wants to charge a call, the operator dials a central computer here with information about the card to be verified. The computer responds verbally with either "call" – which means complete the call; "redial" – which means redial the information into the computer; or "check" – the operator should check the number as a possible fraudulent number.

Last year the revenue loss due to fraud in the Bell System totaled $34 million.

At the Last FJCC

Computer Measurement a Major Theme

ANAHEIM, Calif. – The "considerable excitement" and working-level technical activity surrounding compumetrics, the measurement of computer performance, will come under the microscope during the Fall Joint Computer Conference.

A prime lesson for users, according to one session chairman, is that this excitement and activity should be accompanied by and "tempered with sober reflection at the executive level."

Dr. Arnold F. Goodman noted that compumetrics is an expanding discipline of increasing significance that generates both technical activity and considerable excitement over that activity.

The papers in Goodman's session attempt to provide the executive viewpoint on measurement, with consideration given to auditing system productivity, a hardware view of performance and other outlooks on system design and system software.

Papers were selected from the government, government contractors and from people in the computer industry.

Some of the six measurement sessions

Measurement Sessions	
Wednesday	**Thursday**
8:15 System Performance	8:00 Analytical Considerations
10:30 Executive Viewpoint	10:00 Case Studies
2:00 Software	All Measurement sessions will be held in the Royal Inn (Monopoly Room)
4:00 Monitors	

will feature panel discussions and audience participation, such as Dr. Richard Hamming's session on useful approaches for analytical considerations.

The papers were prepared by individuals from the Rand Corp., the University of Michigan and McDonnell-Douglas Astronautics. Panelists will include Dr. Barry U. Boehm, who participated in the Rand paper, plus Arthur Rosenberg of Informatics and Dr. Mervin Muller of the International Bank for Reconstruction and Development.

Hamming said the measurement session would interest computer center directors, as well as software designers and "specialists in measurement."

There is much "cross-pollination" in the six sessions, possibly because so little work on compumetrics has been published, observers have noted.

Despite Hamming's observation that the discipline is "flourishing these days," few-users, notably Bell Labs, the Department of the Navy and McDonnell Douglas seem prominent in measurement discussions.

. . . At the Core

Computerworld takes an in-depth look at the technical program of the Fall Joint Computer Conference in this three-page section written by Edward J. Bride, editor of CW's Societies/User Group pages.

All regular sessions are listed in the charts. The FJCC will be at the Anaheim (Calif.) Convention Center, Dec. 5 to 7.

One session where none of these sources appears, however, is a case studies panel headed by "computer specialist" Robert Patrick.

Featured during the session will be a benchmark study, funded by the National Science Foundation and conducted by J.C. Strauss of Washington University.

Systems benchmarked included a B6714 (now discontinued from the Burroughs catalog), an IBM 370/155, Univac 1108 and an XDS Sigma 9.

Also in the case study session will be a user panel comprised of participants from Allied Chemical Corp., Stanford Computation Center and the *Los Angeles Times*.

Panelist and paper contributor Boehm will also chair a session on system performance as the first of the six meetings on measurement.

In turn, Hamming and two other individuals will comprise a panel on "facts, figures and fancies," all as part of this opening session on Wednesday morning (second day of FJCC).

On to Anaheim

Boehm's introductory remarks outlined the major problems in the performance analysis field, headed by the fact that "system performance" is applied interchangeably to criteria at several levels in the hierarchy of systems and subsystems.

It is a mistaken impression that optimizing a performance at one level is necessarily optimizing – or even improving – things at other levels, he said.

A related major problem is that the field has little in the way of a theoretical base for more than one level of the hierarchy, he added.

A software validation and reliability session, chaired by Prof. Stephen R. Kimbleton of the University of Michigan will also feature a panel discussion, including Navy Cmdr. Grace M. Hopper, consultant Robert Gordon and Dr. Donald Aufenkamp of the National Science Founda-

(Continued on Page 6)

Heavy User Emphasis in Tech Program Divisions

ANAHEIM, Calif. – Over 90% of the code written for a multi-million dollar system had to be rewritten during implementation, simply because accurate, early determination of users' requirements was not accomplished.

Such instances will be probed by a panel during the FJCC, as part of a technical session entitled "User Requirements of an Information System." This particular session is one of eight devoted to the Users and Applications subdivision of the technical program.

Kenneth W. Hunter, assistant director for ADP in the U.S. General Accounting Office, said the panel would address such problems as identifying the real users, the techniques for documenting and analyzing users' expressed needs, creating and training users' representative staff and managers and programmers concerned with new formal technologies that could form the basis of a sound software engineering discipline, he said.

Users interested in what strategies of program design are "most conducive to obtaining good performance" from the system that will run the program can attend Dr. Peter J. Denning's session on dynamic program behavior.

One session, automated Systems for Programming, will be based on the premise that a language, by itself, is only a small part of a total environment for programming, according to chairman Dr. Robert Balzer of the University of Southern California.

This total environment, Balzer related, must include a text editor knowledgeable about the structures of the language, debugging facilities compatible with the language and a consistent interface with the operating system.

Four technical sessions are devoted to the analysis and simulation division, and are listed in the accompanying chart.

Efforts have been devoted in recent years toward making computers more accessible to the inexperienced or even the non-programmer, according to Prof. Howard L. Morgan of the University of Pennsylvania's Wharton School.

Morgan, who will chair the session on "Human Engineering of Programming Systems – the User's View," listed some of the developments that will be probed in his session: permissiveness on the part of the systems, increased diagnostic assistance, tailored programming languages, the use of natural language inputs and the growth of extensible language systems.

Analysis and Simulation Sessions		
Tuesday	Wednesday	Thursday
1:30 Simulation of Computer Systems 3:30 Advances in Simulation	4:00 Computer-Aided Design	2:15 Advances in Numerical Computation

Software Sessions	
Tuesday	Wednesday
8:45 Operating Systems 1:30 Software Engineering: Theory and Practice, Part I 3:30 Theory and Practice, Part II	8:15 Human Engineering: Users' View 10:15 Dynamic Program Behavior 4:00 Systems for Programming

vertical or adjunct seminars, is Dr. Tad Pinkerton's session on Operating Systems. The papers in this session deal with what Pinkerton called "classical operating systems problems," meaning job and processor scheduling, memory management and algorithms for efficient use of movable-head disk devices in a multiprogramming environment.

Problems in these areas are not solved, Pinkerton acknowledged, adding the papers "demonstrate the new level of understanding in integrating what were collections of conflicting ideas."

Software Engineering

Software Engineering is separated into practical and theoretical parts on Tuesday, as a continuation of the software division. In the first part, Clark Weissman of System Development Corp. suggests software products are still "generally of low quality, maintainability and late in arrival."

The session is intended for technical communications between users and systems builders.

This will not, Hunter claimed, be a theoretical discussion, but will be based on actual experiences with the Congress and other branches of the government, plus private industry where "advanced techniques are being used or tested."

As part of the session, Dan Teichroew of the University of Michigan will explain some inadequacies of management in communicating these needs.

"Users and Applications" is one of seven FJCC divisions, the others being software, hardware, measurement, interdisciplinary topics, systems and architecture and analysis and simulation.

About half the entire technical program is devoted to user, rather than designer interests, according to the American Federation of Information Processing Societies (Afips), conference sponsor.

About half of these user-oriented sessions include panelists to discuss formal papers, while others restrict off-the-cuff comments to audience participation.

The goal of a "Computer Personnel Training" session will be to provoke such discussions, according to Robert N. Reinstedt, who will chair the session.

"Virtually all aspects of training at all levels" will be included in the scope of the discussion, as a result of comments by panel and audience members, he suggested.

Three of the remaining six papers deal in general management issues, while the other three address rather specific user needs such as Graphics, Natural Language Processing and Computer-Assisted Educational Test Construction.

The eight sessions in the Users and Applications division were organized by Ross F. Penne of the University of Southern California, who will also chair a session on "Problems and Practices" of computing installations.

Penne said his entire division would be devoted to day-to-day problems confronting managment, and the first of these sessions appropriately defines these areas:

As a final alternative to the many problems, one paper looks at facilities management. Before deciding on this "marriage of porcupines," as it is called in the paper, a user must first evaluate cost accounting and job billing in-house, a particularly difficult problem in a multi-programming environment, according to session papers.

Existing and hypothetical Data Management Systems will be examined in one session, which will cover the issues of

(Continued on Page 7)

Users and Applications Sessions		
Tuesday	Wednesday	Thursday
8:45 Problems and Practices Computer Graphics	10:30 Educational Test Construction 2:00 Natural Language Processing 4:00 Network Management	8:00 Data Management Systems 10:00 User Requirements 2:15 Training Computer Personnel

User Sessions Not Centralized, Topics Cross Divisional Lines

ANAHEIM, Calif. – About half of the technical program for the Fall Joint Computer Conference is directly related to user problems and ideas, and about half of that is found in two subdivisions: Measurement and Users and Applications.

The remaining half of the user sessions is sprinkled among all other divisions; some user sessions can be found in the software and hardware areas, others in systems and architecture, and still others in the "interdisciplinary" division.

Few of these divisions are completely exclusive – measurement creeps into the software portion and software can be found in the analysis and simulation section, for example.

In the first time slot, aside from the

Measurement to Be Major Theme

(Continued from Page 5)

tion.

During the formal (paper) portion of the session, a Navy Department official will discuss Cobol compiler validation, while Fortran will be the topic of a paper from McDonnell-Douglas.

Monitors Evaluated

Commercially available measurement tools – monitors – will be evaluated in still another measurement session. A total of 10 participants, both users and industry types, will be featured at this session, headed by Jon C. Wilson of the University of Southern California.

Like some of the other measurement sessions, this one will be of greatest interest, Wilson said, to those "responsible for overall installation mangement," and for hardware selection and evaluation and/or operating systems performance.

Wilson also stated this type of session is relevant because measurement is still fairly new and only a very small percentage of computer installations is currently making decisions based on results gathered by measuring.

'Interdisciplinary' Grouping Includes History to Security

ANAHEIM, Calif. – "Something for everybody" has been the unofficial theme or motto of the joint computer conferences for a few years now. The heavy accent on user topics for this FJCC does not diminish the "something" for designers. The technical program is bigger than any in recent memory.

The most difficult division to categorize in the technical program, which includes 59 individual sessions, is the "Interdisciplinary" division. Papers that were neither "Hardware," nor "Software," nor one of the other more specific classes are found here.

Interdisciplinary papers were prepared on data security, communications and interactive processing, artificial intelligence, and even some Historical Perspectives.

Session chairman Dr. Montgomery Phister, Jr., noted computer architecture would be traced from Eniac and other early machines. The evolution of component techniques will be presented, hitting achievements related to logic, main memory, and mass storage.

"The evolution of programming concepts and software to meet ever-expanding user needs and machine requirements," Phister said, is "a most important part of the brief history of computer development."

Two sessions are oriented towards communications users, one stressing systems, and the other describing – through a panel discussion – the service aspects of communications through remote computing.

Almost all the paper authors and panelists are members of the communications industry, as opposed to users. Two exceptions are officials of the U.S. and Canadian governments.

John deMercado of the Canadian Ministry of Communications will deliver a paper on minimum-cost, reliable computer-communications networks, as part of the Data Communications Systems session.

In the "Service-Aspects" session, Lt. Col. Philip H. Enslow, of the federal Office of Telecommunications Policy, will take part in a panel discussion.

The focus of this session, according to co-chairman Eugene C. Gaines, will be on "practical service experience, rather than technical design."

There are four other sessions in this division, and some papers will undoubtedly have high interest with users, while others represent state-of-the-art reports of rather specific devices or techniques.

Two of the four papers on Interactive Processing were written by users, and both deal with experiences (the industry-provided papers discuss "possibilities" of interactive processing).

The user papers describe difficult and

(Continued on Page 7)

No End for Security Session?

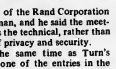
(Continued from Page 6)

costly experiences involved in designing and constructing systems, and how various benefits have been achieved, reported Dr. Christopher B. Newport, chairman.

Newport suggested the session might raise more questions than it will answer, but would nonetheless provide an educational opportunity for anyone contemplating the construction of an interactive system.

In a session with a more narrow orientation, three university types and a Nasa official will address the subject of Robotics and Teleoperators. The prime area of interest in this session is apparently the use of minicomputers in controlling robot arms or other aids to handicapped persons.

In a related session, various Languages for Artificial Intelligence will be probed. Only one session is totally devoted to



Privacy and Security of Databank Systems, but it is an evening session (Tuesday).

Dr. Rein Turn of the Rand Corporation is session chairman, and he said the meeting would stress the technical, rather than social aspects of privacy and security.

Running at the same time as Turn's session will be one of the entries in the hardware division, a session entitled "Array Logic: Where Art Thou? beginning at 8 p.m. Tuesday.

A panel will also discuss topics on chip design with the session open to questions from the floor.

Other sessions in the hardware division are listed in the accompanying charts.

Hardware Division

Tuesday	Thursday
No Tuesday morning sessions and no Wednesday sessions in this division.	8:00 Impact of New Technology on Architecture
1:30 Maintenance and System Integrity	10:00 Technology and Architecture (cont.) -- panel
3:30 Array Logic and Other Advanced Techniques	2:15 Advanced Technical Devices
8:00 Array Logic: Where Art Thou?	Unless otherwise indicated, all sessions are in the Anaheim Convention Center.

Chairman Focuses On Management Issue

(Continued from Page 6)

hidden physical accesses, logical report definition, date entry control and data manipulation.

The session, conducted by John K. Lyon of Honeywell's Deta Base Technology Center, stresses the "continuing conflict between the programmer, the data base administrator, end users and management," Lyon said.

Through the exposure to real and hypothetical systems, attendees should gain some idea of the Data Base Task Group and the Share-Guide recommendations, and why they differ, Lyon added.

'Football' Knees Being Data Banked

PEORIA, Ill. -- A data bank on the condition of local football players' knees is being assembled here.

Every year, before football season, Dr. Bernard Cahill tours local schools examining players for bowlegged or knockkneed conditions and for stretched ligaments or damaged cartilage.

Players Disgnosed

The diagnosis for each player is entered into a computer system which can be accessed from the emergency room of local hospitals.

If a player is injured, the treating physician has immediate on-line access to his history.

Certain students are designated as "guinea pigs" and fill out special forms after each game. These players are used to test the effectiveness of new equipment -- for example, the rotating shoe.

Fewer Knee Injuries

So far the new computer systems claims credit for there being fewer knee injuries in Peoria than the rest of the state.

"The reason may be because we pick these kids (ones with potential knee problems) out ahead of time and have them work on their knees," according to Cahill.

Interdisciplinary Division
*Systems and Architecture Division***

Tuesday	Wednesday	Thursday
	8:15 Data Communication Systems	8:00 Robotics and Tele-operators
8:45 Architecture for High System-Availability (3-1/2 hours)	*8:15 Hardware -- Firmware -- Software Trade-Offs*	
	10:30 Memory Organization and Management	10:00 Language for Artificial Intelligence
1:30 Supercomputers: Present and Future	*2:00 Architecture: Topics of General Interest*	
3:30 Architecture Limitations in Large-Scale Computation	*Distributed Computing and Networks*	2:15 Service Aspects of Remote Computing
8 p.m. Privacy and Security of Data Bank Systems	8 p.m. Historical Perspectives Interactive Processing	*Sessions in Systems and Architecture Division are listed in italic type.*

Editorials

SJCC in Disguise?

Plans and programs are developing at a fast pace for the first National Computer Conference and Exposition (NCC), scheduled for the first full week in June.

The pace is fast because never has the national show (the old "joint" conferences included) been planned on such short notice, but this is how the committees wanted it.

The "call for papers" includes a shorter deadline, and a broader base of subjects.

But the technical program will be broader in scope only if the computer community responds with vigor that is proportional to the planning effort.

We hope the June conference isn't just "SJCC in disguise," and that computer users and industry people will push for a truly representative meeting, not serving special interests.

Throughout this year, most people surveyed by *Computerworld* have approved of the single, national show concept. The technology is not moving nearly as fast as it was five years ago; the once-a-year approach seems to be justified.

Enthusiastic support is equally justified.

More Innovation?

Despite the enticing features of the 370s, the 360 user may soon be able to have the benefits of virtual storage with a "DAT box."

The DAT box will provide the Dynamic Address Translation capability that is the basis of IBM's virtual storage operation. Independent suppliers are seriously considering the introduction of such a device to operate on 360 CPUs.

Many users are determined to hold on to their 360 until all possible upgrades have been exhausted. For some of them the DAT box will offer still another opportunity to innovate.

Arpa Goes Commercial

A commercial version of the Advanced Research Projects Agency (Arpa) communications network may well provide some new network concepts to the computer data user.

Several firms have indicated they plan to set up data network facilities to provide "value-added" concepts, such as resource-sharing, to common carrier lines. The regulatory status of these companies remains to be resolved.

The Arpa network was developed for the research/scientific computer communications user. But there is no assurance that the commercial data communications user is seeking the same type of capabilities.

This user will therefore have to decide what his special needs are. Meanwhile each vendor who proposes to offer this type of service should have the same opportunity to set up its own network facilities.

Also, the Federal Communications Commission, Department of Defense and Office of Telecommunications Policy must assure a fair environment for all the contending firms.

'While You're at It, Could You Catch Us One?'

Letters to the Editor

Assembly Language Good Cobol Alternative

Those members of the data processing community dissatisfied with Cobol have a very obvious alternative, Assembly Language.

It seems to answer all the real and imagined limitations of Cobol. It is not verbose; documentation can be included through the use of comment cards with only a small increase in assembly time; macros are available; input and output can be processed logically or physically and the whole instruction set can be used.

If anything can be programmed it can be programmed in assembler. What more can we ask of a programming language?

Now, with microprogramming, the idea of a common source language is not important because a microprogrammable control section will cause the computer to perform like another. So having a library of Assembly programs would present no real conversion problem via microprogramming.

Rather than ask for "better" programming languages, we should train ourselves to better be able to use the techniques that now exist.

Thomas K. Tate
Director, DP
Lehigh County
Community College
Schnecksville, Pa.

Death of Cobol Would Be Well-Deserved

During a recent seminar I was asked the following question: "I've been programming in Cobol for five years. Do you think I ought to learn another language now?"

My answer was no.

If this individual doesn't understand why this question should never have been asked, then I sincerely hope he finds himself unemployable when Cobol finally meets its well-deserved demise.

Cobol is the world's greatest deterrent to good programming practice. Expunging all the Cobol-only (and Fortran-only) programmers will make professionalism a more readily attainable goal for the rest of us.

Jerry L. Ogdin
Silver Spring, Md.

Buffered Keypunch Is Faster Throughput

In reference to David F. Tierney's OCR "Viewpoint" of Nov. 8:

In each of his comparisons for keyboard devices he has listed labor costs at $4,708. This completely disregards the faster throughput of the buffered keypunch, key-to-disk and key-to-tape devices.

Our company's experience with key-to-tape devices indicates the ability to process 20% to 25% more work with the same number of operators. In view of this, Tierney should have reduced his labor cost by a certain percent to reflect the greater processing speeds of keyboard devices other than the conventional unbuffered keypunch.

If we use 15% to reduce his labor cost for buffered keypunch and key-to-disk, the dollar difference between OCR and other input methods widens quite a bit.

Donald R. Hogan, CDP
Director
Computer Services
Hitchcock Publishing Co.
Wheaton, Ill.

System, Human Errors Are Both Involved

I agree that there was a system error in the Avis case [CW, The Taylor Report, Oct. 18], and that there was human error also involved. However, the logic leading to the conclusion there was a computer or computer system error is somewhat farfetched.

The logic seems to be: "If there is a system error, and if a computer is part of the total system, then all errors are computer system errors." As the entire sequence of events described could easily have occurred even if no computer were involved, it would have been much more accurate to attribute the problem to human, system or management error.

Dale M. Putnam
Project Supervisor
Management
Information Services
Theodore Hamm Co.
St. Paul, Minn.

Afips Conference Manager a New Post

On page 26 of the Nov. 8 issue, Gerard L. van Dijk is reported as having joined Afips as conference manager.

Van Dijk's position is a completely new one (he does not replace a former exhibits manager) which was established because Afips realized that very extensive staff activities were necessary to conduct a successful program of annual National Computer Conferences. Van Dijk will be responsible for overseeing all Afips staff activities pertaining to these national conferences. The exhibits manager is one of the people reporting to van Dijk.

Bruce Gilchrist
Executive Director
Afips
Montvale, N.J.

DP-Aided Architecture Design Not Costly

In the Nov. 1 issue there is an article entitled "Computer-Aided Architecture Design Called Academic," to which I would like to register strong objection.

The writer concludes that currently available systems for the architect are expensive and usable only in very special circumstances.

This firm has recently done a large feasibility study on the ARK II System of Decision Graphics and concludes not only that it is relatively inexpensive, but also it has wide application to this firm's varying project mix. Our benchmark tests have yielded satisfactory results with substantial savings in time and cost.

Joel Robinson
Manager
Computer Services Group
Searle, Wilbee, Rowland
Toronto, Canada

Bring 'Off-Line' Manager On-Line

Let's Give the Internal Auditor Full Responsibility

An auditor is an auditor is an auditor . . . unless he is an internal auditor. That is the somewhat surprising conclusion one comes to after reading the "Statement of Responsibilities of the Internal Auditor," published by The Institute of Internal Auditors, Inc., New York, and after talking with a number of internal auditors.

This revelation sheds some light upon a number of conflicts that have occurred in the past between the auditing staff and the EDP area. Requests for performance measurement data, and other material not obviously related to external auditing requirements have been made, and the EDP staff has been made to feel it has failed in not providing this data – even though it has provided acceptable audit trails, etc.

The Taylor Report
By
Alan Taylor, CDP

Yet the authority for internal auditor to ask for this data was not obvious, for the data involved management-type figures, not accounting ones. Moreover, experience found that if the EDP department did not react to the requests, the auditors did not make a point of it.

New Requests

Recently new types of requests have been made which are not so easy for EDP departments to disregard. These new requests actually involve areas in the data processing function itself – such as asking for lists of the fields in a file that are being controlled in one way or another, or for copies of all software changes that are being made, etc.

The authority for all these requests – new and old – comes right out of the "Statement of Responsibilities." Certainly the knowledge of how EDP is handling control fields is a part of the responsibility of "appraising the quality of performance in carrying out assigned responsibilities." So, it seems clear that the internal auditor is quite correct in asking for this information.

Moreover, he is also quite correct in recommending any appropriate operating improvements – such as firing the data processing manager – to management. (Correct, although sometimes not very politic.)

The backing down of internal auditors when their requests were not answered is more understandable in the light of the political realities that tempet these responsibilities.

Factually, the responsibilities of the internal auditor make him an "off-line" manager who can make requests which involve budgetary expenditures, but who cannot actually authorize the spending. No one knows better than the auditor how necessary funds are – so naturally he often does not press the point.

EDP and the Internal Auditor

For EDP departments, plagued with inadequate and contradictory instructions from management, the situation is fraught with problems. Few installations receive proper guidance on interpreting corporate policies, on expenditures or on allocation methods of accounting practices.

How accurate a picture is needed in the various requested reports, how much funding is available for testing, etc. is rarely left unsaid. EDP must invent as best it can.

No matter what the EDP installation does, therefore, there is always room for different interpretation of the instructions, particularly by hindsight.

Now, as the internal auditors become more familiar with the EDP facts of life the installation will have to respond to their type of off-line management, as well as the official management. And the EDP auditors are getting more and more powerful.

What, then, should an EDP installation do with such an official?

Bring Them On-Line!

My suggestion is to bring them "on-line," where they can be a part of the EDP operation. In short, give them an official position in the EDP area, ask them what type of "preventive controls" are needed, when they wish to receive data, whether EDP should spend any funds on proposed applications, etc.

I recommend bringing them on-line for two reasons. I think internal auditors can be a great benefit to EDPers in improving the quality of the work being performed, and they may help improve the work environment itself.

The internal auditor is responsible for reviewing the entire operations of the firm. Therefore every single program and program specification must be available to him.

The EDP department will need a system of naming all programs, program specifications, etc. and sending them to the auditor for review.

Then you will need to keep all programs up to date – and provide him with assurance that they are up to date. This may take some effort, so you should have a budget item aimed specifically at serving the auditor's needs. If the firm wants to have internal auditors, it will certainly want figures showing how much the internal audit operation costs.

The firm will also want to see that it gets value for its money.

So there will be some effort involved in finding the cheapest way of giving information to the internal auditor.

For instance, it is probably cheaper for the EDP section to provide a list of unchecked fields than a list of controlled fields only. In the latter case, the auditor would have to find a list of all the fields, and check each field off, one by one, to see if the fields are being correctly controlled.

It is much quicker for him to look down a list of uncontrolled fields – and note whether there are any critical areas.

Everyone benefits if the work is done efficiently.

Other areas also should be worked out with the internal auditor. What does he need in a proposal evaluation, for example?

Is it sufficient to just recommend what machine should be installed, or should the details of the contract under which the installation takes place also be included?

Then there is the frequency of bugs in the operating system for which someone has to take responsibility. Should that be included in the evaluation?

These are all questions which should be addressed to the internal auditor so both his department and the EDP area can perform properly.

In short, EDP shall take the internal auditor into its confidence. We should encourage him to undertake the full responsibilities of his position.

EDPers are not going to be able to escape their responsibilities with the internal auditor looking down their necks, so why should the internal auditor escape from his full responsibility?

What Are the Auditor's Duties?

An internal auditor's objective of assisting "all members of management in the effective discharge of their responsibilities," by furnishing them with analyses, appraisals, recommendations and pertinent comments concerning the activities reviewed," goes beyond the accounting and financial records to obtain a full understanding of the operations under review. The attainment of this overall objective involves such activities as:

- Reviewing and appraising the soundness, adequacy and application of accounting, financial, and other operating controls and promoting effective control at reasonable cost.
- Ascertaining the extent of compliance with established policies, plans and procedures.
- Ascertaining the extent to which company assets are accounted for and safeguarded from losses of all kinds.
- Ascertaining the reliability of management data developed within the organization.
- Appraising the quality of performance in carrying out assigned responsibilities.
- Recommending operating improvements.

The "Statement of Responsibilities of the Internal Auditor" was originally issued by the Institute of Internal Auditors in 1947. The continuing development of the profession has resulted in two revisions, in 1957 and 1971.

Letters to the Editor

Rejection Statistics Would Protect Voters

The heart of the troubles with the Rockford, Mich., voting system [CW, Sept. 6] seems to be the absence of detailed rejection statistics. It sounds like another example of the widespread feeling that when system and user conflict, the user (voter) is judged wrong, without appeal or review.

Does the vote-tallying program deliver any statistics of contradictory vote rejects? If not, the program should be discarded immediately as a clear threat to the voting rights of citizens. (Those rejects are people being disenfranchised.)

If the statistics were produced, were there any dry-run or theoretical figures to compare against to determine whether the actual reject level was high? If not, the statistics were meaningless.

If the actual statistics were higher than predicted, an investigation should have started immediately. If the actual rejection statistics weren't higher than predicted, even though a miscount was lurking, the viability of the whole systems design is questionable.

I regret being this harsh, but we've got to remember the importance of the data we process. Voting machines have intricate interlocks built into them, at major expense – why should punched-card balloting system be permitted to ignore the problem?

Robert Higgins
St. Davids, Pa.

Where Is Paging Time?

Mr. Rosenfeld in his letter [CW, Oct. 18] notes that the article by John Hunter and myself [CW, Sept. 20] cautions that the time for paging activities in IBM's virtual memory systems must come from somewhere. His question seems to be, "Where?"

We pointed out in the complete report that system throughput will improve in most cases.

We also suspect that requirements for memory cycles, not the "writing space" set aside by the programmer (or the available page-frame real memory, or speed of the paging device) will be the limiting performance factor in the crunch.

A small program just larger than page size (2K or 4K) that logically should be broken elsewhere than a page boundary would not run as efficiently as a much larger logically optimized program. At present, no facilities exist for such optimization; system discovery of the working set is statistical.

Finally, there is no relocation facility in the System 370.

Dan Tanner
Associate Editor
Auerbach Computer Technology Reports
Auerbach Publishers Inc.
Philadelphia, Pa.

Fortran Offered in '68

An article in the Oct. 25 issue, "Datacraft Adds Fortran," projected an inaccurate picture of Datacraft and its capabilities.

The implication of the headline and text was that Datacraft now, for the first time, was offering Fortran to its customers, although the company has been delivering computers for several years. Actually, Datacraft offered Ansi Standard Fortran IV to its customers right from the start, as far back as 1968 when the company was organized.

The article was based on an announcement by Datacraft introducing the latest member of the Datacraft Fortran family – a new, diagnostic compiler called Forgo which completely eliminates the subroutine link time normally required in other standard Fortran compilers.

R.F. McCullough Jr.
Director Computer Marketing
Datacraft Corp.
Fort Lauderdale, Fla.

NAS Study Available

Concerning the Nov. 1 editorial, "Privacy Battle Not Lost," you neglected to indicate the title, author and method of obtaining the NAS report on data banks.

Oscar Firschein
Information Sciences Laboratory
Lockheed Palo Alto Research Laboratory
Palo Alto, Calif.

The NAS study on *Data Banks in a Free Society* is scheduled for November publication by Quadrangle Books, New York, as mentioned in the CW story [Oct. 25]; the book is based on a summary of the 500-page report; the summary was distributed by NAS, 2101 Constitution Ave., Washington, D.C., 20418. Ed.

Power II Is Subtask

The Oct. 25 article on spoolers incorrectly states that with Power II the user has only two partitions left for applications programs.

I installed it with no program modifications as a subtask in F1 two years ago.

Larry Maddelein
Systems Programmer
Dohrn Transfer Co.
Rock Island, Ill.

According to IBM, Power II normally occupies a DOS partition, but users who have the necessary understanding of the system and the core storage can implement it as a subtask within a partition. Our congratulations to the reader. Ed.

Our 18/30 DMS was designed to appeal to 40% of all IBM 1130 users.

Our new 'Mini' DMS should get the other 60%.

When we introduced our 18/30 Disk Monitor System, we stressed that it was designed as a direct replacement for the IBM 1130, with *significantly* more throughput for about the same cost.

We also took the liberty of mentioning that our 18/30 DMS runs all your present 1130 software and that all programs written under DM2 operate directly on the 18/30 DMS. Finally, we noted the availability of a complete library of our own field-proven software as well as a whole line of faster peripherals like mag tapes, big disks, card readers and line printers.

For 40% of you (namely, those of you who've already reached the throughput limit of your 1130), the 18/30 DMS is great news.

In fact, we've sold nearly 100 systems to date!

The other 60%.

But what about all the rest of you who don't need all that extra throughput or all the added peripherals?

For you, we've got the new 'Mini' DMS.

Also a direct replacement for the IBM 1130.

Yet significantly less expensive to use. *(Up to 40% less expensive per month!)*

But that's not all. Because it makes use of our powerful 18/30 computer, the new 'Mini' DMS will still give you at least as much throughput as your 1130 and in some cases (in disk-type applications) much, much more. And, with the new 'Mini' DMS you can still run all your existing 1130 programs *and* you can still choose from a complete library of our own field-proven software.

How can we get you?

It should be obvious by now that, if you're operating an IBM 1130 system, we want your business.

And now, we've got you covered from both ends.

With our super-throughput 18/30 DMS.

The new 'Mini' DMS. It replaces the IBM 1130 while saving you up to 40% per month.

Or our new money-saving 'Mini' DMS.

Both built and backed by General Automation.

To arrange for a demonstration, please call (714) 778-4800. Or write General Automation, 1055 S. East St., Anaheim, California

(Incidentally, if you're planning to attend the Fall Joint Computer Conference, make a point to stop by Booth 4525. Bring us a benchmark and we'll prove we mean business.)

General Automation

We make exactly what you need.

Random Notes

Payroll From Independent Runs Under DEC's COS-500

NASHUA, N.H. – A version of Data-royal Inc.'s multicompany payroll system is now available for use on a PDP-11 under DEC's new COS-500 operating system (CW, Oct. 11).

The package accommodates a wide variety of payroll types and deduction plans, and is delivered with required federal, state and local tax routines configured to current regulations, the company said.

Originally implemented on IBM's 360 series, the system now is coded in RPG II and operates in 24K bytes on the DEC equipment.

The software can be purchased for $6,500, from 235 Main Dunstable St., 03060.

Datacraft Mini Users Gain String-Processing 'Snobol 4'

FT. LAUDERDALE, Fla. – Snobol 4, a language designed to work with character strings, has been added to the software library for Datacraft Corp. minis. With it, users can work in such areas as compilation techniques, symbolic mathematics, text preparation and music analysis, a Datacraft spokesman said.

By providing the means of breaking strings of characters or mathematical symbols into shorter elements, Snobol4 enables the user to resequence them, test their contents or make replacements. The new language costs $400 and is available through P.O. Box 235550, 33307.

'Documatic' Runs on System 3

FT. LEE, N.J. – IBM System/3 users can generate English language descriptions, I/O record formats and system charts of RPG programs, with a new version of the Documatic documentation software from Data Usage Corp.

Already used on IBM 360 and Univac 9000 series equipment, the system transforms RPG specifications into detailed narratives of the input files, processing steps and output files, as well as "two-dimensional" layouts of all records involved. The package leases for $80/mo and can be purchased for $1,600 from 2460 Lemoine Ave., 07024.

'Quil' Available in D.C. Area

BOWIE, Md. – Small businessmen in the Washington, D.C. metropolitan area can run normal accounting applications and then use their journals as data bases for special report writing and retrievals, with the Quick Inquiry Ledger (Quil) service now available on the Keith Lawrence Associates time-sharing network.

Quil also supports interactive transaction-data-entry editing so errors can be recognized and corrected before they get into the system. Keith Lawrence Associates is at P.O. Box 590, 20715.

Stanford Pair Urge: Use Microprograms for Measurement

By Don Leavitt
Of the CW Staff

STANFORD, Calif. – While microprogramming has been accepted as a valuable tool in system design, it has generally not been used to evaluate the performance of computer systems.

This is unfortunate, according to Dr. Harry J. Saal and Leonard J. Shustek of the Stanford Linear Accelerator Center (Slac), because there are several techniques useful for program monitoring, debugging and system measurement, using the microprogrammable features of an existing CPU.

The measurement system they propose is "completely transparent" to any target program. Given an existing system with a writable control store, Saal and Shustek argue that a microprogram measurement may be "the most flexible, inexpensive, reliable and high-speed means of monitoring the performance of a system."

Conventional software monitors (or "interpreters" as Saal and Shustek call them) provide excellent flexibility, but have undesirable side effects.

They increase target program execution time by "several orders of magnitude." In addition, not all programs can be easily interpreted. I/O activity and interrupt handling are two areas the Slac pair found particularly prone to misinterpretation by conventional software techniques.

The "overwhelming" advantage of microprogram measurement techniques is the assurance that programs are always interpreted correctly. The new approach will even reproduce errors or unusual interpretation given instructions that are not well documented by the computer manufacturer, Saal explained.

Microprogram techniques can collect data at an extremely high rate. This encourages the use of these techniques and, when they are used, provides a much closer approximation of real-time behavior of an existing system.

Because microprogramming is one level closer to the machine, it can be used to measure the effectiveness of operating systems with no restrictions. Conventional software interpreters generally cannot be used to measure an entire system at one time, he added.

Saal and Shustek implemented their techniques on a Standard IC7000 system organized around two independent processing units each of which contained a writable control store of 2K, 18-bit words of vertical microinstructions. Measurement is performed using one of four microprograms, collecting data on either program instruction execution or op code utilization for the CPU or the I/O processor (IOP).

'Most Difficult Problem'

Dealing with the I/O conflict between the microprogram measuring routine and the system being measured was the "single most difficult problem" of the implementation, the researchers said.

To avoid disrupting the register values the target system needed to manage the channels and I/O controllers (but still have the registers for its own needs), the measurement system had to include extensive, but highly efficient storage and retrieval logic.

The system also had to distinguish between I/O requests from the target and the measurement systems, Saal noted.

The lack of general facilities at the microprogram level caused "severe, but not insurmountable" problems, Shustek added, noting this caused relatively more degradation with the micro approach, since the overall performance of conventional interpreters is "so poor."

Instrument tracing and data collection in general is limited by the speed of the output tapes. The Slac researchers found they degraded performance by a factor of 20 using a 60KB, 7-track tape drive for recording trace output.

Vehicle, Equipment Maintenance Controlled With Cosmic Package

ATHENS, Ga. – Users can implement tighter control over both major and minor maintenance schedules of vehicles and other equipment with a Vehicle and Equipment Operations management program, MFS-21478, recently made available through the Cosmic clearinghouse.

It has been installed on Univac 1108 systems operating under Exec 8, but with Cobol as its source language it would appear reasonably transferable to other CPUs as well.

The program is designed to assist in forecasting both budget and manpower requirements for all types of vehicles and equipment. It is said to accumulate statistics important to good planning.

Smooth Workflow

Perhaps most important, the package provides a smooth inspection workflow to the user's maintenance shops. The system generates notifications of all major and minor maintenance inspection requirements on all vehicles or other equipment under the system's control.

The requirements may vary from vehicle to vehicle or from one piece of equipment to another, and need not even be the same for all units of the same basic type.

Where appropriate, the system can be used to recognize alternate maintenance schedules, comparable to the instructions to change oil "1,000 miles or 30-days."

Cosmic seldom defines the core requirements of programs it distributes, and MFS-21478 is no exception. The announcement of the program's availability notes, however, that it includes "approximately" 250 card images. The program, in source code, sells for $550; documentation is available separately for $37.50.

Cosmic is at 112 Barrow Hall, University of Georgia, 30601.

'Imdoc' Searches Textual Files

ELMSFORD, N.Y. – OS/360 users can scan law records, bibliographic abstracts and other files that do not conform to conventional data structures, and print selected references, with the Imdoc storage and retrieval system from Mathematical Applications Group Inc. (Magi).

The system appears to provide more flexibility than some otherwise similar systems. The Imdoc user can inquire against his data base by key word or phrase, but a synonym support facility means that searches may also be based on meaning rather than an exact match to specific words.

Going one step further, Imdoc also includes a translation capability so a search can be conducted in a language that differs from the one used in the data base.

Imdoc's translation support does not include the ability to print out the referenced document in anything but the language in which it was stored, a Magi spokesman stressed.

Searches under any of these options generate, first of all, a report of the number of references found. The user can ask for a printout of some of the referenced documents to determine their relevance.

The indexes used by Imdoc carry nothing more than an indication of the presence or absence of the particular word or phrase in each stored document.

Available in either batch or real-time versions, Imdoc is described by Magi as "easily adapted" to existing telecommunications systems including Faster and IMS/360.

Imdoc requires a 100K-byte partition under OS/360. The batch version is available for $5,000 while the real-time implementation costs $30,000. In either case, three or four man-weeks of installation support will be provided on-site.

The company is at 3 Westchester Plaza, 10523.

Dear Ma: You don't make the best apple pie-or data modems

Ma Bell
195 Broadway
New York, N.Y. 10007

Dear Ma:

Leaving home has really opened my eyes. I still love you, but you don't make the best apple pie. (A cute blonde in the next apartment does.) Or the best data modems. Vadic does.

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These snapshots show why. 16 Vadic modems (300 and 1200 baud, switched or leased) can be freely intermixed in the 7-inch high chassis. Imagine, Ma, 128 Vadic modems in a 7-foot rack!

And look at that uncluttered front panel. Each channel has one status light which blinks to warn of a malfunction. 8 lights display all computer interface leads for any modem selected by the 16-position thumbwheel switch. This remarkable system even has built-in 300 and 1200 baud test signals, local and remote loop-back, 100 hour burn-in plus redundant power supplies.

With such powerful diagnostics, we can pinpoint any trouble fast, whether it's a modem, DAA, cable, connector, remote terminal, the computer or the phone line. Vadic has made trouble-shooting so simple that we do it ourselves, which beats waiting for a Bell serviceman each time a channel "hiccups."

I guess you need the money, Ma. But renting is so expensive. Without increasing our monthly outlay, we'll own our Vadic system in less than a year! It's apple pie time so I'll sign off for now.

P.S. Who's Vadic? They've delivered over 15,000 modems in the past 3 years.

Your son, the independent thinking communications manager.

Alexander Graham Jr.

vadic

Data Briefs

$675/Mo 'Sensible' Terminal Replaces IBM 2780, 3780

LIONVILLE, Pa. – Digital Information Devices Inc. has a terminal system that may save users more than $300 over comparable IBM 2780 and 3780 systems.

Called the "sensible" terminal, the system costs about $675/mo for a key-to-tape unit, 4K mini communications controller, 500 card/min reader and 135 line/min printer.

The key entry unit includes a CRT display and computer-compatible mag tape. The terminal permits packing of variable-block records up to 512 characters for transmission over a binary synchronous network as defined by IBM's Hasp 3.1, the company said.

Data rates up to 9,600 bit/sec are possible for point-to-point, multipoint or dial-up communications with automatic answer capability. Delivery is 120 days from 210 Welsh Pool Road, 19353.

Modem Costs $60

MOUNTAIN VIEW, Calif. – Vadic Corp. has a 103F compatible modem that operates on 4-wire private lines and is priced at $60.

Designed for multipoint polled data nets such as point-of-sale and credit-verification applications, the unit is available in both originate-only and answer-only versions.

Delivery of the modem is from stock from 505 East Middlefield Road, 94040.

WU Adds Cassette

MAHWAH, N.J. – Western Union Data Services has added a magnetic tape cassette system to its EDT 300 terminal.

The system uses Phipps-type cassettes with a capacity of 300 feet storing approximately 50K characters, the company said. The tape unit transmits at 10, 15 and 30 char./sec with a full rewind time of 90 sec.

EIA versions and DAA models with built-in modem are available as well as acoustically coupled units. Prices range from $160/mo to $170/mo. One year and ninety-day leases are available. Delivery is about six weeks from 16 McKee Dr., 07430.

Mite Displays I/O Units

NEW HAVEN, Conn. – Two I/O terminals are now offered to users by Mite Data Equipment.

The Model 123 Keyboard Send/Receive Teletypewriter (KSR) operates at 10 char./sec and the Model 150 KSR is switchable to either 10 or 15 char./sec.

Receive-only units are also available for $1,175 for the 123 and $1,275 for the 150. Send/receive units cost $1,375 and $1,475 for the models 123 and 150 respectively from the firm at 446 Blake St., 06515.

TTYs Replaced

Front End Triggers User's Upgrade

By Ronald A. Frank
Of the CW Staff

GLENDALE, Calif. – While a front-end communications controller usually fits into an existing system, some users begin with a independent controller to configure an entire data network.

The Bekins Co., for example, was using Model 28 TTYs supplied by the local telephone company in what was described as a "torn tape" system. The slow-speed teletypewriter traffic often meant transmission delays when the system was overloaded.

Any data that was transferred from the TTYs to the main Burroughs 3500 CPU had to be manually punched. To add to the problem, Bekins, a nationwide moving company, was using a phone company service based on shared Telpak rates. And when the sharing provisions were no longer available, the line costs for the TTY network became prohibitive.

To modernize its system, Bekins decided to install a mini-based Telecontroller system from Action Communications Systems Inc. (ACS). Rather than fit the Telecontroller into the existing slow-speed equipment, ACS worked with Bekins to introduce faster-speed devices into the nationwide network.

About 49 Wiltek 300, 1,200 bit/sec, buffered terminals were installed at high-volume remote locations and 32 Telex terminals at other sites. The buffer allowed the Telecontroller to poll each remote site and send or receive messages when the terminals were unattended. Since the firm had switched from Telpak to dial-up Wats lines, off-hour unattended operations offered significant line savings.

The Wiltek terminals transmit their data in bisynchronous mode, but the Telecontroller converts messages into Ascii for entry into the 3500. The operation is still off-line from the mainframe and data to be entered into the CPU is recorded on an Ampex tape drive. The tapes are manually shifted to the Burroughs system after being prepared by the Telecontroller system.

The independent front end has been operating for several months, according to Jack Grouches, Bekins director of information systems. Original estimates showed the new system would provide a "very comfortable savings," Grouches said, and already the costs of the communications net have dropped and message throughput has increased.

When the system was operating with Model 28 TTYs, "lost messages" often had to be retyped and retransmitted, according to Jerry Roberts, telecommunications supervisor. But with the Wiltek terminals "all we do is back up the buffer, and retransmit the message without any problem. We don't have to drag that tape out of the wastebasket like we had to in the past," he added.

The Wiltek terminals continuously store the last 50,000 characters transmitted so there is always an accurate "audit trail" of data. The Telecontroller polls each terminal for traffic every 15 minutes. For higher priority sites it can poll every five minutes.

While the TTYs could only "talk" to each other, the Telecontroller allows messages from the faster Wiltek devices to be sent to the slower TTYs still operating in the network, through its store-and-forward capabilities.

The ACS system was provided on a time-share basis to Bekins. On-going support will include the direct interconnection of the Telecontroller with the 3500 "early next year" according to Grouches.

As part of its system configuration, ACS worked with Bekins to select the equipment for the application. The system now utilizes Intertel modems (Bell 202 equivalent) and automatic dialer, a Diablo 2.4M character disk drive and the Nova mini.

On site maintenance is provided by Sorbus under contract with ACS. But an on-line acoustic coupler called a Telecoupler allows Bekins DP personnel to connect into the ACS diagnostic center in Texas for troubleshooting when major network problems occur.

The Bekins network is now handling vital data concerning truck dispatching, registration notices and other requirements for the firm's moving business. But when the Telecontroller is interfaced with the 3500, administrative and traffic analysis work will be done, thereby expanding the capabilities of the entire communications network.

AT&T Reissues Protection Plan; It Would Affect Private Lines

WASHINGTON, D.C. – AT&T has again proposed that protective arrangements be added to private lines, starting early next year. At issue is Bell's contention that access arrangements, or similar measures, should be expanded to include private line users.

Under current interconnection tariffs, dial-up users must install Data Access Arrangement (DAAs) between customer-owned equipment and the telephone line. Such protection should now be expanded to include private lines, according to Bell.

Bell originally filed a private line protection tariff more than a year ago, but opposition from users and a request for a one-year delay from the Federal Communication Commission's Common Carrier Bureau had postponed the plan until November of this year. The FCC had requested another postponement until next November.

The latest AT&T private line protection effort was sent to the commission staff as an application, instead of a formal tariff. Presumably this allows some ground for modification. It also requests "special permission" to institute the proposal.

With FCC approval, all private line systems installed after February 15, 1973 would require the addition of "the necessary arrangements to effect protection against hazardous voltages and longitudinal imbalance."

What Kind?

The exact form of the protection was not defined by Bell. It is not known whether users would be required to have a separate device such as a DAA, or whether the protection would be merely some wiring adjustments made to the user's service terminal.

As part of its application, AT&T said additional protection against excessive signal power levels will be installed at central offices and the "protection will be accomplished by surveillance of the involved private line circuits."

Mini-Based PBX Unit Has Voice Response And Disk Storage

NEW YORK – The Litcom Division of Litton Industries has introduced a telephone-switching system to automate voice and data calls under CPU control.

Using a mini of the Data General Nova (or equivalent) type, the system adds a voice-response capability to eliminate the need for more than one toll operator.

Depending on configuration, the system could save users up to 30% annually in toll and other phone costs by optimizing traffic volume using the most cost-effective lines, the company said. The switching system includes a time-division multiplexing capability to optimize line usage. Either common carrier or independent PBXs can be used with the system.

For data calls, the system will be able to perform code conversion and monitor the status of the data lines. The first system is expected to be installed in-house for internal use by Litcom next February. First commercial deliveries are scheduled for the first quarter of 1973, a spokesman said.

The switching system cost will range from "several hundred to several thousand" dollars per month, depending on configuration. Litton is at 850 Third Ave., 10022.

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Bits & Pieces

IBM 3330 Replacement Can Save Users $100

ANAHEIM, Calif. – IBM 3330 disk drive users now have a replacement for their 3336 disk packs which claims the same operating specifications but at a reduced cost.

The CFI Memories Inc. 3336 disk pack incorporates 10 recording disks with 19 recording surfaces for a storage capacity of 800M bits.

Disk packs are pre-initialized at the factory and defective tracks are flagged and pre-assigned. Reliability is said to be over 30,000 head loadings with normal preventive maintenance.

Units cost $700 for one to four units, $675 for five to nine units; and $650 for 9 to 25 units compared to an IBM price of $775 for each of its 3336 disk packs.

All orders are from 305 Crescent Way, 92801.

New 155 Memory Approved by IBM

SUDBURY, Mass. – Memory Technology Inc. has announced that IBM has agreed to maintain 370/155 central processors with MTI 755 semiconductor memory attached.

The MTI-755 Monolithic Main Memory System is a plug-for-plug equivalent to the IBM 3360 Basic Storage Module used on the 370/155. The memory connects directly to the storage adapter in the 3155, without CPU modification and offers standard increments, from 256K bytes to 2M bytes, according to the firm.

MTI is at 83 Boston Post Road, 01776.

B2500 Users Offered Printer

GARDINA, Calif. – Burroughs' Model 2500, 65/6700 Series users can replace their standard printer with the M470B from Macro Products Corp.

The Macro printer system is plug-interchangable with Burroughs' printer models 9242/9243, either buffered or unbuffered, according to the firm.

M470B characteristics include 1250 to 1800 line/min, vertical format control, 86 and 96 character sets, upper/lower case, 120- and 136-column widths and optional OCR capability.

Purchase price is $31,500 with lease purchase plans available from 14403 Crenshaw Blvd., 90249.

Guide for Terminal Data Offered

LEXINGTON, Mass. – A guide for buyers, salesmen and others on the characteristics and prices of keyboard remote terminals costs $18.50/yr (four issues) from GML Corp.

Included are evaluations of CRT-type computer displays and a comparison of all units, and reports on all keyboard, remote, computer terminals marketed in the U.S.

GML is at 594 Marret Road, 02173.

Digital-to-Voice Converter

Output Device Speaks User's Language

By a CW Staff Writer

GARLAND, Texas – An output device that enunciates English language numbers and phrases is available from Instrumentation Systems Inc.

The Digivox digital-to-voice converter is plug-to-plug compatible with any digital device having parallel Binary Coded Decimal (BCD) positive true logic output – the same as used to communicate to standard printers and other I/O devices, according to the firm.

Using a bank as a sample operation, a teller might want to question the status of a particular account. He would use a Touch-Tone telephone to dial the computer which could connect to the Digivox and ask, "What account do you wish to access?", confirming that access had been made.

The teller would then enter through the Touch-Tone pad the account number and the system would repeat this number to confirm that the right account was accessed.

If the audio information is correct, the user then could enter a code – for example, the number 5 – to indicate he wished to see the present balance.

The Digivox would then repeat the account number, with a pause at proper places and voice drops at the end of each phrase and then would announce the account balance in dollars and cents in English, according to the firm.

Any number between zero dollars and zero cents to $9,999.99 can be enunciated by the machine.

If the teller had wanted to know the date of the last withdrawal, he would have entered a different code.

In addition to numbers, the system

Digivox turns computer input into spoken English.

stores the pronunciation of about 40 words that can be "spoken" in any combination to form phrases.

These words are preset at the manufacturer for each specific application.

The unit is said to be compatible with almost any computer, since the user needs only to code his output in BCD with the computer treating the Digivox much the same as it would a standard terminal.

Queries to the computer can be made in any standard method such as terminal or punched card.

Prices for the Digivox start at $1,925 from 540 Easy St., 75042.

Mini Systems Move Into Education

Both Digital Equipment Corp. and Data General have introduced new minicomputer systems designed for schools and colleges.

The DEC system can be used for both administrative functions and classroom teaching of computer techniques.

For a lease price starting at $1,100/mo users receive a PDP-8 with 12K of core memory, an automatic loader, two dual-tape units and controller, a mark-sense reader, computer terminal and printer.

The basic Eduqystem can be expanded at the user's site by installing new modules, DEC stated.

Software includes application packages for student records, attendance accounting and grade reporting.

Using the mark-sense reader, student grades are entered by pencil on grading forms to be read, listed for verification and output on report card forms.

In the classroom, the system uses Basic to teach students to flowchart and code problems for the computer, according to the firm.

There is also a Fortran operating system for users to write their own programs. These programs can be accessed from the tape units which store almost 400K character records.

In addition, there is a Fortran operating system – PS/8 – which controls the creation, compilation, and execution of large Fortran programs. These programs can access files mounted on any of the four system tape transports.

A new scheduling package with pupil request verification, simple tallies, conflict matrices and resource utilization is scheduled for release in the near future, a spokesman stated.

Five new "Seminar" systems from Data General can support multi-simultaneous users programming in Basic, or they can be dedicated to Fortran or Algol, according to the firm.

The smallest of the new systems, the Seminar 6, is designed for batch operations and can be used for programming instruction, grading tests and computing report cards. Incorporating a mark-sense reader and a line printer it uses a Nova 1220 minicomputer with 16K 16-bit memory and a 1.25M-word disk subsystem.

The Seminar 7 is a 16-user time-sharing system composed of a Nova 1220 mini with 24K of memory, line printer, mark-sense card reader, paper-tape reader, 1.25M-word disk subsystem and eight teletypewriters.

The Seminar 8 allows users to operate either under batch or interactively. It includes a 2-drive cassette system and can support up to 16 simultaneous users. System configuration is a Nova 800, 256K-word Novadisc cassette subsystem, line printer card reader, paper tape reader and eight teletypewriters.

The Seminar 9 uses a Nova 800 to allow up to 32 simultaneous users. Included are a 256K-word Novadisc, 1.25M-word moving-head disk and one teletypewriter. A school can thus select a mix of terminals to best suit its needs, the firm said.

The Seminar 10, also a 32-user system, adds a card reader and line printer, and two 9-track magnetic tape units to the Seminar 9 hardware. The system also comes with one TTY.

All systems are hardware- and software-compatible so a user can upgrade without having new requirements, the firm noted.

Prices for the systems are $47,050 for the Seminar 6; $65,000 for the Seminar 7; $74,865 for the Seminar 8; $55,350 for the Seminar 9; and $92,700 for the Seminar 10.

Deliveries are set for January 1973.

No Software Support Needed to Produce Graphs, Charts

IRVINE, Calif. – Five new X-Y plotters allow users to produce graphs and charts without a supporting computer or software, according to the manufacturer, Valtec Corp.

Three models are plug compatible with the Olivetti P602 programmable calculator using calculator commands to control the plotter. Plots can be provided on 11 in. by 17 in. single sheets or on computer fan-fold paper, depending on the model ordered.

Two larger models operate directly from display or hard-copy terminals.

Plug Compatible

The Model 2041/121 is plug compatible with TTY/RS232 devices, operates at 10, 15 or 30 char./sec, and can be operated on- or off-line from Ascii or Ebcdic data, according to the firm. The unit incorporates an automatic paper feed for using continuous fan-fold computer paper.

The Model 2021/121 is a lower-cost model which plots on 11 in. by 17 in. sheets of paper and has the same operating specifications as the larger plotter.

Models 2020, 2021 and 2942, which operate with the Olivetti calculator, cost $2,650, $2,995 and $3,350 respectively.

Models 2024/121 and 2021/121, operating from terminals through acoustic couplers, cost $3,600 and $3,245 respectively.

Lease rental plans are available on all units from 17751 Sky Park Circle, 92707.

User Tells How Pooling Peripherals Boosted Workload With Same Budget

By E. Drake Lundell Jr.
Of the CW Staff

HARTFORD, Conn. – The Hartford Insurance Co. was able to increase its workload by well over 25% without an increase in its monthly hardware budget by reducing the number of CPUs and pooling all peripherals in the system.

This was made possible by going to somewhat more powerful central processors, but mainly by the pooling of the peripheral equipment, Hartford sources said.

The pooled environment, noted David H. Berg, vice-president for data processing, provides "considerable" economies over the dedicated method of operation and definitely "more bang for the buck."

Situation Outlined

Just one year ago, the Hartford operated nine CPUs – a 370/155 with 1M byte; a 1M byte 360/65, a 768K 360/65, a 512K 360/50, a 128K 360/50, a 16K 360/30 and three 8K 360/30s.

The peripherals included 43 2420-type tape stations, 30 2401-type tape stations, 14 2314-type disk drives (108 spindles), two 2311-type disk drives and 11 printers.

All of the peripherals (except seven printers) were dedicated to a single CPU.

This operation resulted in inefficiencies, according to Berg, because several of the machines had to be large enough to handle the largest job in the shop for back-up purposes.

This made the operation somewhat I/O bound, he said, while it was not CPU bound.

To overcome the problems and the expense of the system, The Hartford reduced the number of CPUs in the shop by four and began to pool all of its peripherals, thereby allowing any CPU to use any peripheral that was free.

Present Configuration

The installation now basically consists of one 2M byte 370/165 and two 1.5M byte 370/155s. The installation also kept one 8K 360/30 to handle small card jobs, which were previously out of the mainstream of processing.

The peripherals under the new setup include 48 3420-type tape stations, three 2401-type tape stations, 11 3330-type disk drives (88 spindles) and 10 printers (nine in the pool environment).

Pooling has been effected electronically by adding standard IBM switching equipment to the 370 systems and this permits them to use any free peripheral device in the center.

While the switch was being made, the workload of the installation grew 30% in 1971 and is projected to be 25% higher this year.

The total monthly hardware costs, on the other hand, are the same today as before the conversion, according to Edward J. Becan, assistant director for planning and systems support at the installation.

And the costs would have gone down, he indicated, except that costs for supplies such as disk packs, etc. are included in the budget. Also, the hardware budget includes telecommunications costs, which have increased dramatically in the time covered.

But while the hardware costs are the same today on a monthly basis, he noted they did rise 13% during the conversion period, because of the necessity of overlapping systems during the switchover.

In addition, Becan estimated the present hardware configuration would be able to handle the pooling and the use of "more cost-effective hardware," Becan said.

However, Becan said, the firm planned to isolate its teleprocessing system (based on one of the 370/155s) and therefore would add another 155 next year for backup and to take the place of the system lost when it was dedicated to teleprocessing applications.

Major Problem

This will overcome the major problem with the present arrangement, he said, which is a lack of backup.

"When you lose one 50 out of 8 systems, you are not losing a large percentage of your processing power, probably only 15% to 20%," he noted.

"But when a 165 goes down and is part of a three computer system, you lose 40% to 50% of the power of the configuration," he added.

This is especially critical for someone like The Hartford, he said, which is running a large teleprocessing network. "You have to have a backup for the teleprocessing machine," he indicated, "so when it goes down, you effectively lose two machines from routine processing, since it is out and its backup cannot be used for regular work."

While The Hartford has not been "totally happy with its recovery and backup" facilities under the three computer system, Becan estimated a three computer system would be adequate for similar installations that were not running a teleprocessing network.

At the same time, he said, the addition of the third 155 would give Hartford enough backup with the teleprocessing part of the system isolated. "We plan to stay with four processors," he said, "and don't expect any problems with backup."

Another major problem that would face users in a pooled environment, Becan added, is the necessity of integrating the total workload of the shop to better use the computing power efficiently.

Different Scheduling

"Operating in a pooled environment calls for a completely different type of scheduling," he noted, "than operation in an environment where all the peripherals are dedicated to certain machines."

To accomplish this type of integration, he said an installation would have to use a lot of simulation and emulation to operate all of its programs and jobs efficiently.

"The smaller workloads are harder to integrate," he warned, "than the larger ones, which are relatively easy."

The center planning to go to the pooled environment also must pay a lot of attention to the operating environment and the personnel who will be making the shift and should not devote "all of its attention to the hardware," Becan said.

"The workflow for the operation has to be optimized to get the maximum benefits from a pooled environment," he said, noting it is often "hard to stabilize the workflow while making the shift from one method of operation to the other."

But even with the problem areas, the people at The Hartford agree the new, pooled arrangement offers greater economy than the dedicated method of operation.

Disk Memory System Can Store 10M Words

SCOTTSDALE, Ariz. – For $4,950 PDP-11 users can get a moving-head disk memory system with 1.25M words of storage including software, controller, disk, power supplies and cabling required to "plug into" the Unibus, from International Memory Systems.

The Data Miser Model 110 Disk Memory System can be field-expanded with seven additional disks to the initial controller for a total capacity of 10M words, according to the firm. Each additional 1.25M word drive sells for $1,950.

The data transfer rate is 10 msec/word with an average random access time of 75 msec.

All units are warranted for one year from 14609 N. Scottsdale Road, 85254.

Strip Printer Costs $295

SECAUCUS, N.J. – For $295 users can buy an alphanumeric strip printer from Facit-Odhner.

The 4552 produces hard copy on paper strips, at a printing speed of 15 char./sec and is available in three versions from 501 Winsor Drive, 10530.

CI Notes

Adapso Names Officers

NEW YORK – The Association of Data Processing Services Organizations, Inc. (Adapso) has elected officers and established special interest sections.

T. J. O'Rourke, Tymshare, Inc., was named president, with R.W. Olsen, Computer Services Corp., vice-president. John Duffendack, Com-Share, Inc., was named president of the Computer Timesharing Services Section (CTSS) of Adapso, and Martin Goetz, Applied Data Research, is president of the Adapso/AISC (software) Section.

The newly established Data Center Section is headed by Robert Olsen, Computer Services Corp.

RCA Building Small Multiprocessor

CAMDEN, N.J. – RCA's Advanced Technology Laboratories is developing a multiprocsor model for the National Aeronautics and Space Administration under a $2.2 million contract.

The system, Space Ultrareliable Modular Computer (Sumc), will feature hybrid packaging and Large Scale Integrated arrays. A simplex 32-bit unit with 8K word memory and I/O will weigh 10 lb. and occupy less than one-half cubic foot, the firm said.

The simplex CPU is designed to be comparable in throughput with units such as the IBM 360/65, RCA said.

Supershorts

ITT Data Services will provide marketing and support of Applied Data Research, Inc.'s software packages in Brazil.

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Data 100 Corp. has enlarged its line of bank credit to about $17.8 million from about $8 million, allowing it to "considerably expand" its direct leasing of terminals, a spokesman said. The firm plans to increase production capacity through expanded plant space.

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Computer Transceiver Systems, Inc. and Litton ABS Division have signed an agreement under which Litton will purchase about 550 Model 1200 terminals for marketing to OEMers and other Litton Divisions. Computer Transceiver will continue to market the terminal to end users.

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Sycor, Inc. has begun marketing operations in Canada through Sycor International Ltd.

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General Electric Co. Ltd. of England has joined the list of suppliers to MCI Communications Corp. that have guaranteed a portion of MCI's indebtedness. General Electric Co. Ltd. has guaranteed up to 60% of the purchase price of equipment it sells to MCI.

Petition Justice Department

Lessors Hit IBM Maintenance Hikes

By E. Drake Lundell Jr.
Of the CW Staff

WASHINGTON, D.C. – The Computer Lessors Association (CLA) has called on the Justice Department to force IBM to roll back recent maintenance price increases for purchased machines under the terms of the 1956 Consent Decree between the government and IBM.

At the same time, the group, in letters to the division and to President Nixon, has also called for more long-term relief in conjunction with the present antitrust suit the government is pressing against IBM.

The group has also brought what it considers the inequitable price increases to the attention of Judge David Edelstein, who is presently hearing the government-IBM suit. Edelstein also signed the 1956 Consent Decree between the two parties.

Resolution Adopted

In a resolution adopted by the organization, whose members currently own approximately 2,000 IBM computer systems with an original value of over $2 billion, CLA called on the President and Department of Justice to "implement a renewed and strengthened policy of prosecution of the government's antitrust action to enjoin the monopolistic and predatory practices of IBM as they affect the public interest and the computer industry as a whole.

"It is absolutely necessary," CLA went on, "to the preservation of a viable computer industry that the Department of Justice provide effective and determined relief through vigorous prosecution for trial of the action against IBM."

If the prosecution cannot succeed quickly, the organization indicated "an effective, enforceable and actually enforced consent decree" might be the proper course of action.

Enforcement Policy

In the resolution, the organization called for "an enforcement policy with respect to the provisions of the existing 1956 Consent Decree compelling IBM to provide and maintain data processing machines at reasonable and non-discriminatory rates, terms and conditions to owners of IBM equipment as well as lessees."

In contention is a recent maintenance price rise on the part of IBM which saw the maintenance rates of some purchased gear go up around 8%, while the lease price, which includes maintenance, stayed at the same level.

The CLA members feel this price rise is in clear violation of Section VI of the 1956 Consent Decree, which states: "It is the purpose of this Section IV of this Final Judgment to assure users and prospective users of IBM tabulating and electronic data processing machines at any time being offered by IBM for lease and sale an opportunity to purchase and own such machines at prices and upon terms and conditions which shall not be substantially more advantageous to IBM than the lease charges, terms and conditions for such machines."

Because of these provisions in the decree, CLA called on Justice and the courts "with immediate urgency" to apply for an "injunction against IBM's policy of continuing to discriminate against owners by increasing monthly maintenance charges for certain equipment as they did on Aug. 29, 1972, without corresponding increases for equipment under IBM lease.

"This IBM policy directly flouts the 1956 Consent Decree and the antitrust laws in general; and CLA demands remedy through an immediate government effort for an injunction.

"If this IBM policy of discriminating against owners," the organization continued, "is permitted unchecked, it will be the prelude of a continued series of IBM announcements creating a total environment discouraging the purchases of IBM equipment in favor of a return to the exclusive lease policy of IBM before 1956."

While the Justice Department has been mostly noncommittal to these charges, at least on the surface, Thomas E. Kauper, assistant attorney general in the Antitrust Division, promised the lessors that their charges of violation of the 1956 Consent Decree are being "brought to the attention of the attorneys charged with enforcement of that decree for their consideration."

Annual POS Shipments Expected To Hover in $70 Million Range

NEWTONVILLE, Mass. – Shipments of point-of-sale terminals will reach the 20,000 annual level next year and then hold steady in the $60 million to $70 million range for the next few years, according to International Data Corp., a computer industry research firm here.

At the same time, the firm predicted, the installed base of POS systems in general merchandising applications will climb steadily from a base of about 10,000 during 1972 to almost 200,000 units by 1980. The value per unit will drop, however, from the present $3,500 level, the firm projected.

Singer is presently the market leader in the field, the firm said, with an estimated 60% of the market for such systems installed. Its recent acquisition of the Electronic Store Information Systems Division of Nuclear Data boosts its total by adding another 500 units to that installed base.

But the firm with the most to lose to the new POS systems is NCR, the firm said, because it presently holds approximately 70% of the cash register market. At the same time, IDC reported NCR is "picking up steam" in the POS market with its 280 retail terminal system.

Pitney Bowes-Alpex is another large factor in the market with shipments of the Spice system exceeding the $1 million level in July and with over 2,000 spice systems installed in over 100 retail outlets and a 100/mo delivery rate.

The two major problems facing this segment of the market at present, IDC said, are the development of credit-authorization systems and the standardization of marking for automatic label reading.

"On the credit front," IDC said, "most retailers and POS suppliers have left this to companies in that business, requiring only that hardware manufacturers make provision in their product and wiring requirements for the inclusion of both store-wide and centralized credit checking."

At the same time, IDC predicted "a solution to standardization will be coming shortly" with the adoption of the widely used 10-digit Store Keeping Units for merchandise marking.

With such a large market opening for suppliers, IDC predicted IBM would enter the field in the near future, which could cause a new set of problems for the established entries in the field.

Sweden Plans to Boost Domestic DP Firms

SWEDEN – Saab and the Swedish Government have joined in an effort to put Sweden's computer industry on an even level with other nations. By giving Saab financial grants and preferential treatment for buying equipment in Sweden it is felt Saab can improve its competitive position.

Previously, Saab has not enjoyed the level of governmental support available to other European companies. It has received neither the preferential purchasing treatment given to domestic manufacturers, nor direct aid.

The lack of funds has caused Saab to rely heavily on outside suppliers – especially for peripherals – and has restricted its marketing to Sweden and Eastern Europe, industry sources noted.

The company already has started to study marketing in other areas with major concentration on selling its D5 minicomputer.

Honeywell Names Lund Corporate VP

MINNEAPOLIS, Minn. – The importance of Honeywell's computer operations was emphasized with the promotion of Edward C. Lund from vice-president and general manager of the firm's North American computer operations to corporate vice-president of administration.

Lund will be responsible for corporate field administration services, corporate procurement and field marketing.

Replacing Lund as the top man for the company's U.S. computer operations will be Robert P. Henderson, who has been vice-president and associate general manager for the operation for the past year.

Other Changes

■ Potter Instrument Co., Inc. has appointed Robert J. Brown senior vice-president and Dermott Noonan vice-president, finance and controller.

■ James R. Sherburn has been named president and chief executive officer of Academy Computing Corp.

■ John M. Curley has been appointed president of Computer Hardware Maintenance Co., Inc., a subsidiary of Computer Hardware Consultants & Services, Inc.

■ William Demmer has been named director of systems development at Telex Computer Products, Inc.

■ Reinhold M. Tischler has been named manager, industrial engineering for the Systems, Manufacturing and Engineering Group at Burroughs Corp.

■ Kenneth R. Fannin has been appointed manager of disk operations for the Ampex Computer Products Division.

■ Fred Colman has joined Computer Identics Corp. as vice-president, government relations.

■ D. Jeffrey Blumenthal has been named vice-president, technical services and Erwin A. Marks vice-president, consulting at On-Line Decisions, Inc.

■ Kenneth R. Killion has been elected vice-president of Data Processing Consultants, Inc.

Executive Corner

■ Reid W. Dennis has been elected chairman of the board and chairman of the executive committee of Recognition Equipment, Inc.

■ William Bernstein has been named vice-president, engineering, and M. Andrew Haladej vice-president, international operations, at Sanders Data Systems.

■ Samuel N. Irwin, president of Sycor, Inc., has been named chairman of the board; G. William Ince was appointed vice-president, manufacturing support and planning and Raymond P. Kavlick vice-president, engineering.

■ Bernard J. Greenspan was elected president of MDC Financial Corp., and Gilbert N. Zitin was selected president of MDC Leasing Corp., both subsidiaries of Management Data Corp.

■ William C. Bennett has been named assistant to the president of GTE Information Systems and Duane E. Glaubitz vice-president and general manager of the Mountain View, Calif., plant.

Contracts

The Social Security Administration has leased additional tape subsystems under its contract with Storage Technology Corp.

The Wolf Research and Development Corp. has received a $300,000 contract to analyze the performance of Nasa's Spaceflight Tracking and Data Network.

Informatics Inc. has been awarded a three-year contract by the Jet Propulsion Laboratory for programming for Nasa Projects involving the Space Flight Operations Facility and Deep Space Net Tracking Stations.

Keane Associates, Inc. and Delphi Associates have received a contract valued at over $200,000 to modify and install a Medicaid management information system for the state of New Hampshire.

Computer Sciences Corp. has received a contract from National Can Corp. to develop a nationwide on-line information system.

Computer Audit Systems, Inc. has been awarded a $67,000 contract by the U.S. Comptroller of Currency to install a customized version of its Computer Audit Retrieval System.

Versatec, Inc. has received a contract from Hazeltine Corp. for over 50 Matrix printers which will be used with Hazeltine Model 4000G CRTs in the Nasa Skylab program.

Cadence Industries Corp. has awarded a facilities management contract to System Development Corp.

Computer Sciences Corp. has received a three-year contract to provide technical assistance to the National Aviation Facilities Experimental Center.

NCR's Postal Systems Division has received a $1.4 million contract from the U.S. Postal Service for test models of the service's facer/canceler machine.

System Development Corp. has been awarded a contract by Oklahoma City to develop and install a traffic signal control network.

Quantum Science Corp. has received a contract from the state of Israel to study Israel's data communications requirements through the mid-1980s.

Alden Recorder Provides CRT Hard Copy

WESTBORO, Mass. – The Alden 600 recorder uses facsimile recording techniques to provide graphic hard-copy records from CRT display terminals.

Priced in single quantities at $2,400 with discounts dropping the price to $1,830 in quantities of 100, the unit generates CRT recording on electrosensitive paper at 30 line/sec or 20 sec for a 600-line frame and 30 sec for an 800-line frame.

The recording is available immediately with no further processing, and the cost of supplies is said to be less than 1 cent/frame, the company stated.

The unit can be "easily" interfaced to most graphic display terminals, the firm said, and comes with synchronous drive motor, sweep trigger output pulse, internal marking amplifier and customer interfaces to an XY sweep generator. Sufficient power and card file space are provided for addition of customer's circuitry within the unit housing.

New OEM Products

The unit takes a standard 170-ft roll of 6-in. wide Alfax Type A Hi-White recording paper, and the standard sweep speed is 1,800 rpm or 300 sweep/sec, according to the firm at the Alden Research Center here.

$120 Keyboard Announced

BURLINGTON, Mass. – Data Electronics Corp. has a keyboard priced as low as $120 in OEM quantities which incorporates many IBM Selectric features with the addition of special function keys needed by peripherals manufacturers.

The 78-char. keyboard combines typewriter and adding machine layouts with "N-key" rollover to allow additional keystrokes and code generation while any number of keys is held down.

Non-Selectric features found on the unit include home position keys, externally controllable keyboard locking and tri-level Ascii codes, the firm said.

3330-Like Head Shown

LOS ANGELES – A narrow track flying head for high-track density movable-head disk drives with over 500 track/in. and greater than 4,000 bit/in. is available from OMI Memories Inc.

The IX-150 heads can store densities of over 2 x 10^8 bit/in., the firm claimed, and are designed to fly approximately 45 μin. above the disk surface. The mounting configuration is completely compatible with standard 3330-type heads which permits mounting on existing carriages or test beds, OMI added.

Designed to operate at 3,600 rpm with a resonant frequency of 20 MHz, evaluation heads are available on a two-week delivery basis from 5621 W. Imperial Highway, 90045.

Other OEM Products

Western Magnetics, Glendale, Calif., is offering a line of magnetic heads for 1/4 in. tape that are compatible with the 3M Data Cartridge. The units are available in 1-, 2- and 4-track configurations with selective erase and are capable of speeds to 90 in./sec.

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A family of microprogrammed MOS/LSI data processor circuits is available from the MOS Products Division of Fairchild, Mountain View, Calif. The PPS-25 Series comes as six basic building blocks: The processing unit is a 4-bit parallel device with 95 instruction set and a 62.5 μsec word time and

Alden 600 Recorder

2.5 μsec bit time.

A multivoltage regulated power supply for the Burroughs Self-Scan panel display has been announced by the firm's Electronics Components Division, Plainfield, N.J. The units cost $211 each in quantities of 100.

A data terminal interface providing serial Ascii code output from a 128-channel analog data-acquisition system is available from Moxon Inc., Irvine, Calif. The basic system is priced at $770.

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A new tape transport from Peripheral Data Machines, Inc., Hicksville, N.Y., offers six electronically switchable speeds. Tape widths are available in 1/4 in., 1/2 in., and 1 in.

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The Doctor 12 test system from Adar Associates, Inc. can test either memory cards or systems of up to 16 million locations by 72 bits. An optional test head converts Doctor 12 into a chip tester.

The test program and results are displayed on a CRT.

Laser Comp Information Systems claims a recently developed Laser Ray Tube can be used instead of CRTs in COM and other applications. The LRT system, the firm said, makes possible the use of a non-silver film, as the photographic recording medium.

The firm is at 845 Foxon Blvd., E. Haven, Conn. 06512.

Fall Joint's dates changed. So did ours.

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New Guinea Set To Purchase Service Bureau

Special to Computerworld

PORT MORESBY, Territory of Papua, New Guinea – Chief Minister Michael Somare has announced that following a submission from the Public Service Board, the administrator's executive council has approved the acquisition of the local computer bureau, Electronic Computers Pty. Ltd., at Waigani by the Papua-New Guinea Government.

By agreement with International Computers Pty. Ltd. Australia, the bureau's equipment will be expanded to cater more adequately to government requirements. The government would operate the bureau for its own purpose, making specified time available to ICL, so existing commercial customers of Electronic Computers could use computer facilities.

Somare said over the past few years departments had made increasing use of computers by using the local computer bureaus in Australia. The acquisition of Electronic Computers would be effective from July 1, 1972.

The Territory of Papua-New Guinea now being administered by Australia is expected to become independent by 1975.

The Novar 5-50 and 5-60 terminals prepare both hard copies of business papers and tape copies of the information they contain. The data can be transmitted from the batch mode at any time to a Novar 7-70 Data Collector which records the information on IBM computer compatible tape, ready for processing. it's an immediately available telecommunication system.

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New Markets Opened

Ready to Take Advantage of Virtual Machines?

By John Hunter and Dan Tanner
Special to Computerworld

This is the fourth in a series of articles on the effect of virtual storage. The previous articles dealt with the effects on the user; this covers the industry effects that can be expected.

By omitting the Models 155 and 165 from free upgrades to virtual memory operation, IBM is banking on most users returning their systems for the new Models 158 and 168.

This appears to be a fairly safe bet, for both new models have includes an upgrade to virtual storage at no additional cost. Whether users will accept the tradeoff of reduced performance for considerable rental savings plus no conversion costs is still a big question.

Virtual Storage Part IV

Big questions also center around how the independent disk and memory vendors will react to the new configurations which, on the surface, appear to be a "sledge hammer." Equally important are the moves IBM's competitors will take.

Disk Vendors Hurt

There is no doubt that the plug-compatible disk vendors have been hurt by the inclusion of the integrated storage contrbl in the mainframe, and the introduction of the 3333 disk as the control module between the mainframe and the 3330s. But to say they'll be destroyed is absurd.

The greatest potential loss the independents will incur will be in the disk controllers they employed in the past. The loss, however, could be minimized (if not eliminated) by microprogramming the controllers to allow 3330 disks to run on the System 360 Models 30, 40 and 50 – a market still untapped.

As for the new 3333-3330 marriage, it would appear that the independents will duplicate the interdependent circuits spread between these units and be back in business – this time selling disk controllers instead of "boxes."

The compatible memory vendors will also take their "lumps" due to virtual memory. In all but very special cases, it will be impossible to convince anyone that fast but expensive core is better than slow but cheap disk storage.

One alternative is to sell more core for main storage use, thus increasing the number of applications that could be run simultaneously. This would necessitate only adding two bits to the nonaccessible memory associated with each page frame.

However, beyond a certain limit adding more core buys nothing unless more memory cycles and faster paging are introduced.

IBM's practice of announcing systems well in advance of delivery has in the past been successful in chilling the market for competitors. Whether IBM is successful this time depends on the determination of its competitors – especially those with virtual memory machines.

By endorsing virtual memory, IBM has given the competitive markets a perfect opening to sell immediately available equipment in what was a skeptical market. They are also selling "proven" technology, where IBM's has yet to meet the test in the field.

The authors are associate editors with Auerbach Computer Technology Reports.

Orders & Installations

The Garden City, N.Y., branch of Bloomingdale's has installed a Pitney Bowes-Alpex Spice electronic register system with online credit verification capabilities.

The Rhode Island Hospital Trust National Bank of Providence has installed Scientific Computers, Inc.'s Mach 1 banking software system for demand deposit and check credit transactions.

The State of Arizona has ordered Comten Inc.'s 3670 communications control unit.

John Carroll University, University Heights, Ohio, has ordered a Burroughs B5700 that will be used primarily to provide time-sharing capability to faculty and students.

The Michigan State Department of Social Services has installed a Univac Series 70/6 system and has another on order. The system will be used to handle inquiries and updates of public and medical assistance files and determine recipient eligibility, as well as process payment information.

The *Detroit News* is installing the Tal-Star T1000 Production System for news, display and classified ad production.

The Mount Sinai Medical Center, New York City, has installed Information Equities Inc.'s Hospact patient accounting system.

Mountain Bell Telephone Co. has ordered two Xerox Sigma 3 computers for use in communications message-switching systems for the accounting and directory departments.

American Micro-Systems, Inc., Santa Clara, Calif., has ordered a Burroughs B6700 which will aid in the design and production of microcircuits.

The Westinghouse Lamp Division of Westinghouse Electric Corp. has ordered a Teleswitcher DCS-5000 Communications Control System from Computer Control Systems Inc. The system will be used to handle order entry and shipment information carried on its network.

The Geisinger Medical Center, Danville, Pa., has installed a Honeywell Series 2000 system for clinical and administrative applications.

The Newport Mesa Unified School District (Calif.) has installed a Decsystem-1040, for use in class scheduling, report card preparation, state reporting and student instruction.

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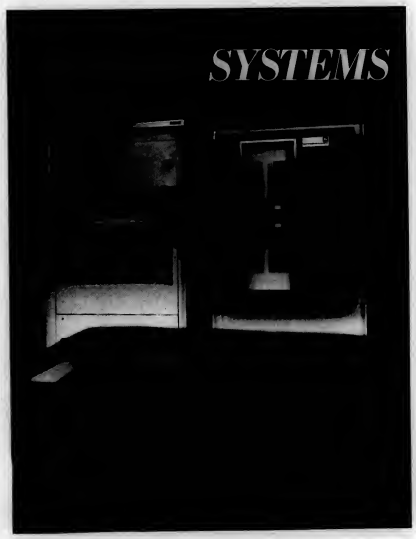

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3 Memory Makers Score Earnings Gains

Three memory manufacturers, Advanced Memory Systems, Inc., Electronic Memories & Magnetics Corp. and Fabritek, Inc., have reported sharply improved earnings pictures, with AMS and Fabritek scoring turnarounds for the year and six months, respectively.

AMS earned around $325,000 compared with a loss of almost $1.8 million in the year ended Sept. 30, 1971.

Revenues soared to $12.8 million from $2.2 million in 1971, and earnings, before special credit for tax carryforward, are pegged at between $300,000, or 20 cents a share, and $350,000, or 23 cents a share. In 1971, the firm lost $1.8 million.

EMM Strong

EMM showed a stronger quarter ended Sept. 23, than either the same period a year ago or the preceding second quarter.

"We have experienced a very strong rebound of order input each quarter this year," observed President Trude Taylor. Total new orders during the first nine months of 1972 were $65 million, up 37% from the $47 million booked in the first three quarters of 1971.

Backlog at the end of September rose to $38 million from $33 million a year ago.

"We are encouraged by the increasing rate of end-user core memory and disk pack installations, even though an increasing ratio of leases to sales may be experienced in ongoing periods which will defer profits into the future as revenues are realized from the leases," he added.

Bank loans were reduced below the level at year-end 1971, and the firm expects to negotiate a new credit line during the fourth quarter.

The three components of the firm, Memory Products Groups, the Magnetic Products Group and Electroglas Inc., each operated profitably during the third quarter — for the first time in a year-and-a-half, Taylor said.

EMM has also agreed in principle to sell its Electroglas, Inc. subsidiary to Xynetics, which would "complete the return to our main strengths in memory products and ferrite/magnetic products," according to Taylor.

In the third quarter, EMM earned $1 million, or 14 cents a share, including a $400,000 special credit, compared with $716,000, or 8 cents a share in the year-ago period, when the special credit totaled $485,000. Second-quarter earnings were $6,000.

But the third-quarter results were not enough to offset a $627,000 first-quarter loss, and while revenues rose to $57.7 million from $56.7 million a year ago, earnings totaled $1.2 million, or 8 cents a share, down from $2.9 million, or 39 cents a share a year ago.

At Fabritek, revenues during the second quarter ended Sept. 29 rose over 80%, to $5.4 million from almost $3 million a year ago.

Earnings rose to $135,548, or 4 cents a share, compared with a loss of $446,105, or 14 cents a share in the year-ago period.

"The order rate was more than double that of last year, with all segments of the company contributing to the increase," noted H.F. Mickelson, president.

"The domestic OEM Products Division has had a significant increase in orders. Margins remain low, but with the increased volume we expect this operation to be profitable for the year," he added. Orders also improved at the European OEM division.

End-user products "contributed substantially to our increased business," Mickelson said.

For the six-month period, the outlook was also bright, with a turnaround in earnings from operations to $38,149, or 1 cent per share compared with a loss of $821,004, or 25 cents a share in the period last year.

Revenues rose to $9.7 million from $6.3 million.

With a $1.9 million extraordinary gain from the sale of Nicolet Instrument Corp., the six-month earnings for last year climbed to $1.1 million, or 34 cents a share. In the current half year, earnings after extraordinary items were $116,007, or 4 cents a share.

New Registrations

ODEC INC., 25 Greystone St., Warwick, R.I., printer manufacturer, filed to register 800,000 shares of common. Proceeds, at $5 per share, to be used for product development and for working capital. The underwriter is Legerco, Neuffer & Co. Inc., 345 Park Ave., New York, N.Y. 10022.

MSI DATA CORP., 340 Fischer Ave., Costa Mesa, Calif., source data entry terminal manufacturer, filed to register 320,000 shares of common, acquired by Westland Capital Corp. upon exercise of warrants. Westland proposes to distribute these shares to holders of its stock at the rate of 1.6 MSI shares for each Westland share.

IDENTICON CORP., 300 Second Ave., Waltham, Mass., data acquisition systems developer, filed to register 200,000 shares of common. Proceeds, at $8.50 per share, to be used to repay bank loan and for working capital. The underwriter is W.E. Hutton & Co., 14 Wall St., New York, N.Y. 10005.

CONTROL DATA CORP., 8100 34th Ave. S., Minneapolis, Minn., mainframe maker, filed to register 41,753 shares of common of which 20,800 are issuable upon exercise of warrants issued by Syntonic Technology, Inc., 14,500 issuable upon conversion of debentures of Syntonic, 4,654 issuable upon conversion of 5% guaranteed convertible debentures of CDC International Finance Corp., and 2,597 offered at $70.79 per share.

DATA DISPLAY SYSTEMS, INC., 31 Union Square W., New York, N.Y., a services firm for the medical field, filed to register 17,935 shares of capital, issuable upon exercise of warrants held by F.S. Donahue, Santo & Co., which proposes to offer the shares at $10 per share maximum.

ADVANCED TERMINALS INC., 220 Third Ave., Hawthorne, N.Y., microfilm equipment developer, filed to register 200,000 shares of common. Proceeds, at $10 per share, to be used for research and development and working capital. No underwriter is involved.

DCS COMPUTER SERVICES INC., 39 Rector St., New York, N.Y., a DP services firm, filed to register $1 million of 8-1/2% convertible subordinated debentures, due 1982. Proceeds, at 100% of principal amount, to be used for working capital. The underwriter is Morgan, Kennedy & Co, Inc, 5 Hanover Sq., New York, N.Y.

TRADE*QUOTES

Computerworld Stock Trading Summary

All statistics compiled, computed and formatted by TRADE*QUOTES, INC. Cambridge, Mass. 02139

CLOSING PRICES THURSDAY, NOVEMBER 16, 1972

E		PRICE				E		PRICE			
X		1972	CLOSE	WEEK	WEEK	X		1972	CLOSE	WEEK	WEEK
C		RANGE	NOV 16	NET	PCT	C		RANGE	NOV 16	NET	PCT
H		(1)	1972	CHNGE	CHNGE	H		(1)	1972	CHNGE	CHNGE
		SOFTWARE & EDP SERVICES				O	TAB PRODUCTS CO	14- 23	22	-1	-4.3
						N	UARCO	21- 28	22	+ 1/4	+1.1
O	ADVANCED COMP TECH	1- 3	1 3/4	- 1/4	-12.5	A	WABASH MAGNETICS	6- 11	7 1/8	- 1/4	-3.3
A	APPLIED DATA RES.	4- 7	3 7/8	- 1/8	-3.1	N	WALLACE BUS FORMS	21- 26	23 1/4	0	0.0
O	APPLIED LOGIC	1- 6	1 3/4	- 1/2	-18.2			COMPUTER SYSTEMS			
N	AUTOMATIC DATA PROC	72- 99	93 1/2	-2	-2.0						
O	BRANDON APPLIED SYST	1- 2	3/4	0	0.0	N	BURROUGHS CORP	147-226	212 1/8	+3 5/8	+1.6
O	COMPUTER DIMENSIONS	5- 14	5 1/4	- 5/8	-10.6	N	COLLINS RADIO	14- 20	17 5/8	- 1/2	-2.7
O	COMPUTER DYNAMICS	1- 4	1 3/8	+ 1/8	+10.0	N	CONTROL DATA CORP	43- 78	61 5/8	-1 3/8	-2.1
						O	DATA GENERAL CORP	56-115	99 1/2	-11 1/2	-10.3
O	COMPUTER NETWURK	3- 7	2 7/8	- 1/8	-4.1	O	DIGITAL COMP CONTROL	9- 25	7	- 1/2	-6.6
N	COMPUTER SCIENCES	4- 10	3 1/8	- 1/8	-2.7	N	DIGITAL EQUIPMENT	72-101	85 1/8	+ 3/8	+0.4
O	COMPUTER TASK GROUP	1- 2	1 1/8	+ 1/8	+12.5	N	ELECTRONIC ASSOC.	6- 13	8 3/4	0	0.0
O	COMPUTER TECHNOLOGY	4- 8	4	0	0.0						
O	COMPUTER USAGE	7- 14	7 5/8	- 3/8	-4.6	A	ELECTRONIC ENGINEER.	6- 14	8 3/8	+ 1/2	+6.3
O	COMP AUTOMOT REPORTS	5- 9	8 1/8	0	0.0	H	FOXBORO	23- 41	29 1/4	+1 3/8	+17.5
N	COMPUTING & SOFTWARE	14- 28	16 1/4	+2	+14.0	O	GENERAL AUTOMATION	13- 39	16 1/4	-1 1/4	-7.1
						O	GRI COMPUTER CORP	2- 5	2 5/8	- 1/4	-8.6
O	COMRESS	1- 3	1 1/4	0	0.0	N	HEWLETT-PACKARD CO	46- 77	69 3/4	+ 1/4	+0.3
O	CONSHARE	5- 10	8 1/8	- 5/8	-6.4	N	HONEYWELL INC	118-170	120 5/8	- 7 1/8	-5.5
O	DATATAB	5- 9	4 1/2	+ 1/8	+2.8	N	IBM	333-426	385	+13 1/2	+3.6
O	EDP RESOURCES	2- 8	3	- 1/4	-7.7						
A	ELECT COMP PROG	1- 5	1 3/4	- 1/4	-12.5	O	INTEROATA INC	8- 16	10 3/4	+ 3/4	+7.5
N	ELECTRONIC DATA SYS.	43- 65	59 1/2	+2	+3.4	N	MEMOREX	15- 34	17 3/4	+ 1/8	+0.6
O	INFORMATICS	5- 11	5 1/4	- 1/8	-2.3	O	MICRODATA CORP	5- 10	7 5/8	- 5/8	-7.5
						N	NCR	29- 38	32	-1 7/8	-5.5
O	I.O.A. DATA CORP	1- 3	1	+ 1/8	+14.2	N	RAYTHEON CO	27- 47	35	+4 5/8	+15.2
O	KEANE ASSOCIATES	4- 7	4 3/4	- 1/4	-5.5	N	SPERRY RAND	30- 49	45 5/8	-1 3/4	-3.6
O	KEYDATA CORP	7- 13	10 3/4	- 1/2	-4.4	A	SYSTEMS ENG. LABS	7- 16	7 1/2	- 1/4	-3.2
O	LOGICON	4- 9	5	- 1/8	-2.4						
A	MANAGEMENT DATA	4- 11	4 3/4	- 3/8	-7.3	N	VARIAN ASSOCIATES	14- 22	18 1/4	-1	-5.1
O	NATIONAL CSS INC	8- 31	29 1/4	- 1/4	-0.8	N	VICTOR COMPTOMETER	15- 24	18	+1 7/8	+11.6
O	NATIONAL INFO SRVCS	2- 8	3 1/8	- 1/8	-3.8	A	WANG LABS.	25- 61	27	- 1/4	-0.9
						N	XEROX CORP	121-172	149 1/2	- 1/2	-0.3
P	ON LINE SYSTEMS INC	8- 28	27 1/2	+2 5/8	+10.5			LEASING COMPANIES			
N	PLANNING RESEARCH	6- 17	7 7/8	- 1/2	-5.9						
O	PROGRAMMING METHODS	20- 24	24 1/2	+1	+4.2	A	BODTHE COMPUTER	4- 18	4 1/8	- 1/4	-5.7
O	PROGRAMMING & SYS	1- 2	1 1/8	- 1/8	-10.0	O	BRESNAHAN CORP.	2- 3	1 3/4	+ 1/4	+16.6
O	RAPIDATA INC	5- 27	25 1/2	+ 3/4	+3.0	O	CORDURO INC	1+ 1/2	2 1/2	- 1/2	-3.3
O	SCIENTIFIC COMPUTERS	2- 7	2 1/8	- 3/8	-15.0	O	COMMERCE GROUP CORP	5- 11	5 3/4	- 1/2	-8.0
O	SIMPLICITY COMPUTER	1- 5	3	0	0.0	O	COMPUTER EXCHANGE	1- 3	2	- 1/8	-20.0
						A	COMPUTER INVSTRS GRP	7- 14	7 1/8	- 1/4	-3.3
O	TBS COMPUTER CENTERS	3- 6	3 1/4	0	0.0	N	DPF INC	5- 13	5 3/4	+ 1/4	+11.5
O	TCC INC	1- 3	1 1/8	0	0.0						
O	TYMSHARE INC	7- 11	8 3/4	+ 1/8	+1.4						
O	UNITED DATA CENTER	5- 8	6 1/4	- 1/4	-3.8	H	OATRONIC RENTAL	1- 5	3/8	-1 7/8	-83.3
N	UNIVERSITY COMPUTING	9- 26	11	-1 1/8	-15.2	A	DCL INC	1- 10	2 1/2	- 3/4	-23.0
A	URS SYSTEMS	6- 10	7 5/8	- 1/8	-1.6	A	DEARBORN-STORM	16- 26	21 1/2	+1 1/4	+6.1
						A	DPA, INC.	5- 10	8	+ 1/2	+6.6
		PERIPHERALS & SUBSYSTEMS				A	GRANITE MGT	5- 11	6	- 3/8	-5.8
						A	GREYHOUND COMPUTER	6- 11	7	- 1/8	-1.7
N	AGORESS&GRAPH-MULT	34- 49	33 3/4	-1 1/4	-3.5	A	ITEL	7- 12	9 1/4	0	0.0
O	ADVANCED MEMORY SYS	12- 25	13 3/4	+1 1/4	+6.2						
N	AMPEX CORP	5- 8	6 1/8	- 1/8	-2.0	N	LEASCO CORP	17- 24	19 5/8	-1 1/8	-5.4
O	ANDERSON JACOBSON	1- 8	4 3/4	+ 3/2	+11.7	O	LEASPAC CORP	6- 15	7 1/8	+ 1/8	+1.7
O	ATLANTIC TECHNOLOGY	1- 3	1 1/8	0	0.0	O	LEISRO NET INC	1- 3	1 1/4	0	0.0
O	BEEHIVE MEDICAL ELEC	1- 6	5 3/4	- 1/2	-8.0	A	ROCKWOOD COMPUTER	2- 7	2 1/8	- 1/8	-5.5
A	BOLT,BERANEK & NEW	5- 25	13	- 1/8	-0.9	O	SYSTEMS CAPITAL	3- 20	19 3/4	+1	+10.2
						N	U.S. LEASING	19- 33	29 1/2	- 3/4	-2.4
N	BUNKER-RAMO	9- 14	9 3/8	+ 1/4	+2.7						
A	CALCOMP	5- 25	7 3/8	- 3/4	-7.4	EXCH: N=NEW YORK EXCHANGE; A=AMERICAN EXCHANGE					
O	CAMBRIDGE MEMORIES	9- 15	11 1/4	- 1/8	-1.0	L=NATIONAL EXCHANGE; O=OVER-THE-COUNTER					
O	CENTRONICS DATA COMP	6- 27	24	+1	+4.0	H=PHIL-MULT-HASH					
O	COGNITRONICS	2- 5	2 1/4	- 1/8	-5.2						
O	COMPUTER COMMUN.	1- 7	2 1/2	- 1/2	-4.7	D-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID					
A	COMPUTER EQUIPMENT	3- 6	2 1/2	- 1/4	-9.0	(1) TO NEAREST DOLLAR					
O	COMPUTER MACHINERY	7- 13	10	- 1/2	-4.7						
A	COMPUTEST	5- 9	6 1/8	1/2	-10.4						
A	DATA PRODUCTS CORP	3- 7	5 1/8	- 1/8	-4.6						
O	DATA RECOGNITION	1- 5	3/8	- 3/8	-50.0						
O	DATA TECHNOLOGY	2- 5	3 1/4	+ 3/4	+30.0						
O	DI/AN CONTROLS	0- 8	4 3/8	+ 1/8	+2.9						
N	ELECTRONIC M & M	3- 8	4 3/8	+ 1/4	+10.5						
O	FABRI-TEK	3- 5	3 1/8	- 1/4	-7.4						
O	GENERAL COMPUTER SYS	7- 16	8	- 1/4	-3.0						
N	GENERAL ELECTRIC	59- 70	67 5/8	+2 5/8	+4.0						
A	HAZELTINE CORP	7- 13	8	+ 1/8	+1.5						
O	INFOREX INC	20- 36	22 3/8	- 7/8	-3.7						
O	INFORMATION DISPLAYS	1- 5	1 7/8	- 1/4	-4.5						
A	LUNDY ELECTRONICS	8- 14	8 1/8	- 1/4	-2.9						
O	MANAGEMENT ASSIST	1- 2	1/2	0	0.0						
A	MILGO ELECTRONICS	15- 44	16 3/4	+ 7/8	+5.5						
N	MOHAWK DATA SCI	11- 22	13 1/2	+ 1/8	+0.9						
O	OPTICAL SCANNING	6- 16	8 1/2	+2	+30.7						
O	PERTEC CORP	3- 17	3/4	- 1/2	-5.7						
O	PHOTUN	6- 15	7	0	0.0						
A	POTTER INSTRUMENT	7- 21	9 3/8	+ 1/8	+1.3						
O	PRECISION INST.	3- 13	3	-1	-25.0						
O	RECOGNITION EQUIP	5- 15	8 7/8	+1	+12.6						
N	SANDERS ASSOCIATES	15- 21	16 7/8	+1 7/8	+12.5						
O	SCIENTA DATA	5- 12	5 1/4	- 1/4	-4.5						
O	STURAGE TECHNOLOGY	17- 30	31 3/4	- 1/4	-0.7						
O	SYKON INC	7- 11	10 1/2	0	0.0						
O	TALLY CORP.	8- 15	11 3/8	+ 1/8	+1.1						
N	TEKTRONIX INC	34- 64	48 3/4	-1 3/4	-3.4						
N	TELEX	6- 15	5 1/2	- 7/8	-13.7						
N	WILTEK INC	10- 17	13 3/2	- 1/4	-1.8						

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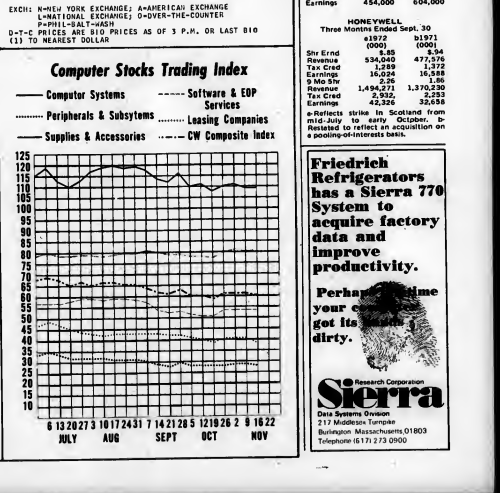

Earnings Reports

ITEL
Three Months Ended Sept. 30

	1972	a1971
Shr Erng	$.03	$.01
Revenue	23,097,000	25,540,000
Chic Op		(1,059,000)
Earnings	232,000	77,000
9 Mo Shr		.46
Revenue	62,682,000	81,084,000
Chic Op		(3,322,000)
Earnings	(2,568,000)	3,280,000

COMPUTER SCIENCES
Three Months Ended Sept. 29

	1972	a1971
Shr Erng	$.08	$.08
Revenue	$34,317,000	$36,064,000
Tax Item	595,000	(1,206,000)
Earnings	(595,000)	1,133,000
6 Mo Shr		.17
Revenue	65,767,000	69,944,000
Tax Item	1,803,000	(2,381,000)
Earnings	(1,803,000)	2,335,000

a-Restated, b-Includes $7.2 million from sale of the company's remaining 38% interest in Computax Services Inc.

SPERRY RAND
Three Months Ended Sept. 30

	1972 (000)	a1971 (000)
Shr Erng	$.57	$.53
Revenue	529,196	405,997
Earnings	19,547	11,161
6 Mo Shr	1.09	.91
Revenue	1,028,885	820,211
Earnings	37,416	24,645

a-Restated to reflect adoption in March 1972 of equity method of accounting for investments representing minority ownership in other companies.

VICTOR COMPTOMETER
Three Months Ended Sept. 30

	1972	1971
Shr Erng	$.29	$.16
Revenue	54,306,692	44,231,873
Earnings	1,910,277	884,590
9 Mo Shr	.78	.36
Revenue	152,988,663	121,931,958
Earnings	5,065,404	2,344,669

WANG LABORATORIES
Three Months Ended Sept. 30

	1972	1971
Shr Erng	$.14	
Revenue	58,004,401	7,853,154
Earnings	(116,626)	557,998

SYKES DATATRONICS
Six Months Ended Aug. 31

	1972	1971
Shr Erng	$.01	$.09
Revenue	1,088,268	852,809
Earnings	4,709	64,322

PERTEC
Three Months Ended Sept. 29

	1972	1971
Shr Erng	$.15	$.20
Revenue	5,945,000	5,601,000
Earnings	454,000	604,000

HONEYWELL
Three Months Ended Sept. 30

	1972 (000)	b1971 (000)
Shr Erng	$.85	$.94
Revenue	534,040	477,576
Tax Cred	1,289	1,372
Earnings	16,024	16,588
9 Mo Shr	2.26	1.86
Revenue	1,494,271	1,370,230
Tax Cred	2,932	3,253
Earnings	42,326	32,658

a-Reflects strike in Scotland from mid-July to early October, b-Restated to reflect an acquisition on a pooling-of-interests basis.

Hazeltine 2000 System

1. Start with the CRT Terminal that's No. 1 in Price/Performance.

☐ 1998-Character Display ☐ Selectable Transmission Rates up to 9600 bps ☐ Full-Duplex, Half-Duplex and Batch Operating Modes ☐ Two-Level Video Intensity Split Screen ☐ Automatic Tabulation ☐ Editing Capability ☐ Random Access Memory

$88 PER MONTH*

2. Add the powerful, high-speed "dual" Tape Cassette Unit.

☐ On/Off-Line Data Storage & Retrieval ☐ Paper Tape Emulation and Page Operating Modes ☐ 2400 Baud Data Transfer Rate.

$79 PER MONTH*

3. Or add the Printer Unit for silent hard copy.

☐ Conversation and Page Operating Modes ☐ Print Rates up to 30 Characters Per Sec.

$78 PER MONTH*

4. Put them all together for complete System capability.

$245 PER MONTH*

*12-MONTH RENTAL, MAINTENANCE INCLUDED. ASK FOR A DEMONSTRATION.

Hazeltine Corporation

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